PB88-185798

Superfund Record of Decision (EPA Region 3) Kane and Lombard Site, Baltimore, Maryland (First Remedial Action), September 1987

(U.S.) Environmental Protection Agency
Washington, DC

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Superfund Record of Decision:

Kane & Lombard, MD

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16. ABSTRACT

The Kane and Lombard site is an 8.4-acre parcel of undeveloped land in Baltimore, Maryland. Dumping and burning of construction debris, domestic trash and drums occurred at the site from 1962 until 1967 when the city passed an ordinance prohibiting the open burning of refuse. Illegal dumping continued from 1967 until approximately 1984, during which time many citations were issued for illegal burning on the property. In 1980 Maryland State inspectors observed between 400 and 500 drums, the majority of which were rusted, damaged and contained holes. Following an onsite property assessment, EPA authorized the immediate removal of 1,163 drums in 1984. Of those, 822 drums were classified as empty and 341 drums contained contaminants which included: benzene, toluene, xylene, PAHs, PCBs and heavy metals. Approximately six inches of soil below the drums were removed and disposed offsite. The site was stabilized by regrading, capping and revegetation. Currently soil and ground water are contaminated with these prior drum contaminants.

The selected remedial action for this site includes: removal of drums, hot spots and contaminated soil (approximately 67,000 yd^3); site cleaning and removal of vegetation to facilitate the construction of subsurface containment/diversion structures; construction of a multi-layer soil cap; construction of drainage system; clearing of drainage ditch along east side of the site; development of necessary surface water

(See Attached Sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Kane & Lombard, MD First Remedial Action Contaminated Media: gw, soil Key contaminants: VOCs, PCBs, PAHs, organics, heavy metals		

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Kane & Lombard, MD
First Remedial Action

16. ABSTRACT (continued)

run-off management facilities; and ground water monitoring. The estimated capital cost for this remedial action is $4,692,660 with annual O&M of $28,930.

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

Kane and Lombard Superfund Site - Source Control East Baltimore, Maryland.

Statement of Purpose

This decision document represents the selected remedial action for this site developed in accordance with CERCLA, as amended by SARA, and to the extent practicable, the National Contingency Plan.

The State of Maryland has concurred on the selected remedy.

Statement of Basis

This decision is based upon the administrative record (index attached). The attached index identifies the items which comprise the administrative record upon which the selection of a remedial action is based.

Description of the Selected Remedy

This remedy focuses only on the Kane and Lombard property because adjacent properties are in the process of being investigated by the State of Maryland. Ground water in the area will be deferred in this Record of Decision until further investigations on these other potential sites are concluded.

The selected site remedy does not attempt to ensure compliance with all ARARs, but will be consistent, to the extent practicable, with those action specific ARARs.

The selected remedy consists of the following:

* Removal of drums and hot spots, contaminated soil on the site.
* Site cleaning and removal of vegetation to the extent necessary for construction of the necessary components.
* Construction of subsurface containment/diversion structures to both prevent the uncontrolled lateral migration of presently contaminated shallow ground water from the site, and prevent the lateral recharge flow of uncontaminated ground water into the waste area.
* Construction of a multilayer soil cap over the area to prevent the infiltration of precipitation and surface water into the waste area.
* Construction of a drainage system.

///

* Clearing of drainage ditch along the east side of the site.

* Development of necessary surface water runoff management facilities.

* Continued ground water monitoring of the site.

DECLARATION

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate, and is cost-effective. By removing the identified hot spots, this remedy satisfies the preference for treatment that reduces toxicity, mobility, or volume as a principal element.

9/30/87
Date

James M. Seif
Regional Administrator

Site Description and Summary of
Remedial Alternative Selection
for the Kane & Lombard Superfund Site

Introduction

The overall objective of the Remedial Investigation/Feasibility Study (RI/FS) was to collect information needed to evaluate actual and potential risks to receptors from exposure to site-related contamination in soil, surface water, or ground water. This information supported a feasibility study of remedial alternatives for controlling sources of contamination on the Kane and Lombard site. Because of the absence of nearby domestic supply wells, this investigation did not include the collection of data needed to evaluate alternatives for active aquifer restoration. Furthermore, the investigation focused only on the Kane & Lombard property because adjacent properties are in the process of being investigated by the state of Maryland. Ground water in the area will be deferred in this Record of Decision (ROD) until further investigations on these other potential sites are concluded.

Site Location and Description

The Kane and Lombard site is an 8.4 acre parcel of undeveloped land located in the Orangeville Subdivision in the southeast quarter of Baltimore, Maryland. The site is southwest of the intersection of Kane and Lombard Streets, is directly adjacent to Patterson High School on the site's east and south boundaries, and is within one-quarter mile of the Francis Scott Key Medical Center. Other nearby properties are industrial and commercial. Residential properties are located within one-third of a mile southeast of the site. Figure 1 is a map of greater Baltimore with an index map of the vicinity of the Kane and Lombard property.

Between 1962 and 1971, the site was excavated and refilled with solid and hazardous wastes. Between 1971 and 1984, dumping occurred at the surface of the site. In 1984, surface wastes were removed and the site was graded, capped, and fenced under an EPA immediate removal action. This action removed the direct contact threat with surface contamination. Contaminants including ethylbenzene, dichloroethene, vinyl chloride, and polynuclear aromatics have been detected in the soil or the ground water at the site, but not in the air or surface water. Several properties adjacent to the site were also excavated and may have been used for the disposal of solid and hazardous wastes. There are also several other possible principal hazardous waste sites located within two miles of the Kane and Lombard site that may impact environmental conditions in the area.

The fill encountered on the site is a heterogeneous mix of construction debris, domestic trash, and hazardous chemical wastes. The fill increases in thickness northward to over 14 feet near Lombard Street. The volume of the fill on-site is estimated to be approximately 57,000 cubic yards.

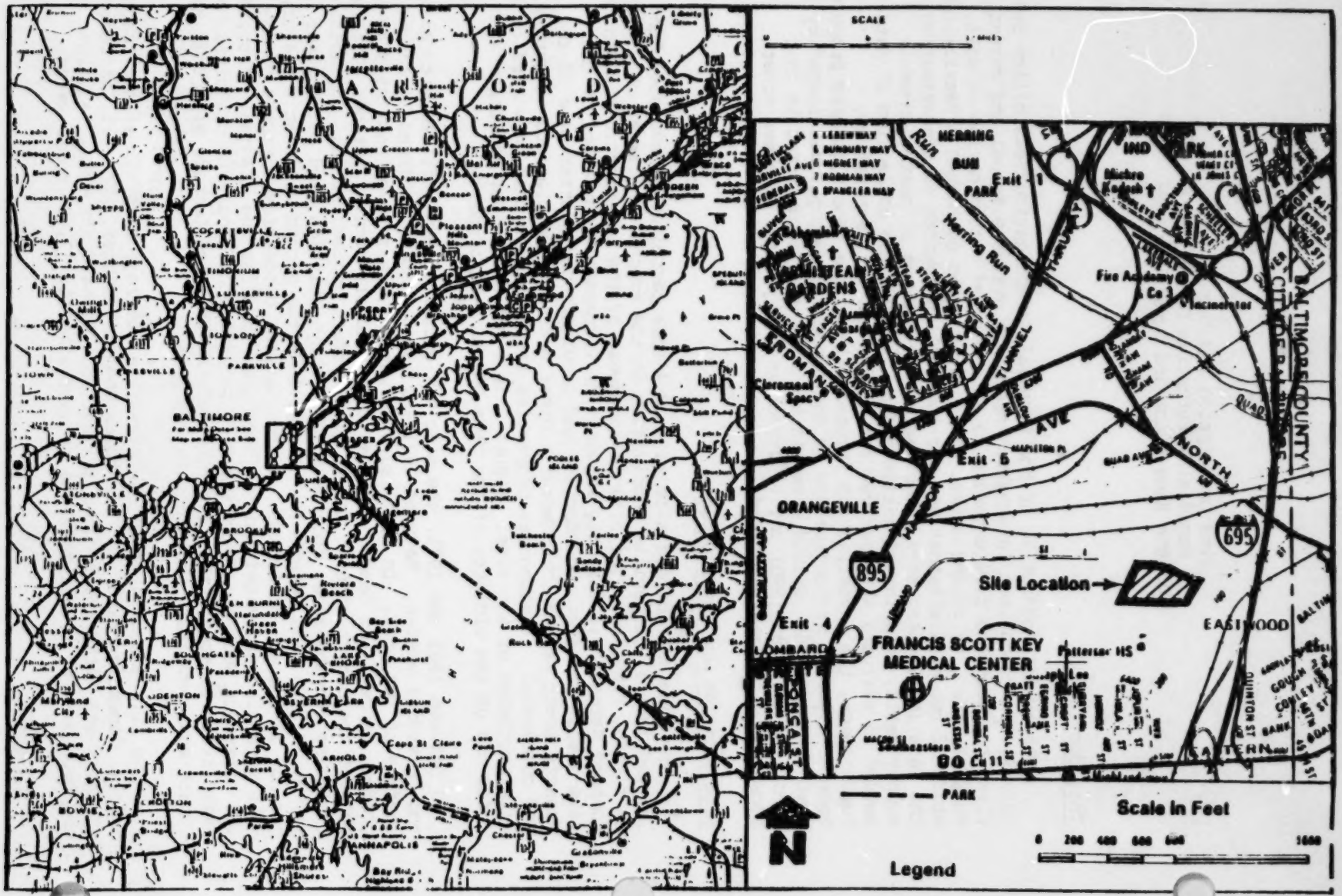

FIGURE 1 MAP OF BALTIMORE IN THE VICINITY OF THE KANE AND LOMBARD SITE

There are three relatively permeable water-bearing zones underlying the Kane and Lombard site to a depth of 150 feet. The first water-bearing zone consists of fill, sandy silt, and silty clay between 10 and 40 feet deep. A 25-80 foot thick layer of silty clay, clay, and sandy silty clay separates the first and second water-bearing zones. The second water-bearing zone consists of sandy silt and silty sand between 50 and 120 feet deep. A layer of clay to sandy silty clay approximately 20 feet thick separates the second and third water-bearing zones. The third water-bearing zone consists of sand and silty sand over 130 feet deep.

Site History

Prior to about 1920 the area now occupied by the Kane and Lombard site was undeveloped woodlands. Based on a comparison of topography between 1922 and 1968, approximately ten feet of fill was distributed on the site after 1922.

In 1962, Edward and Harietta Azrael and Albert and Cele Landay acquired the Kane and Lombard property. At that time Mr. Landay owned two other properties in the area, purchased in 1948, both of which had been operated as dumps. Dumping and burning occurred on what is now known as the Kane and Lombard site and the area north of it from 1962 until 1967 when the City of Baltimore passed Ordinance No. 1062 prohibiting the open burning of refuse. Illegal dumping continued from 1967 until approximately 1984 during which time many citations were issued for illegal burning.

In November 1980, Maryland State inspectors observed between 400 and 500 drums on the property. The majority of the drums were rusted, damaged, and contained holes. After negotiating at length with the property owner over site clean up, the State of Maryland issued a Complaint and Order in August 1983 ordering the owner to clean up the site. The owner appealed the Order. The State was unsuccessful in forcing compliance, and in April 1984 requested the assistance of EPA under the authority of CERLCA. As a result of the request, the State and EPA performed an on-site assessment of the property. EPA authorized the immediate removal of 1,163 drums from the site in June 1984. Of those, 822 drums were classified as empty. Contaminants in the remaining 341 drums included benzene, ethylbenzene, toluene, xylene, naphthalene, and other polynuclear aromatics, PCBs, phthalates, cyanide, and several heavy metals. Approximately 6 inches of soil below the drums was removed and sent offsite for disposal. The site was stabilized by regrading, capping and revegetation.

In October 1984, the site was included on the National Priorities List (NPL). A RI/FS began in October 1985 and was completed in June 1987. In April 1987, the site was again regraded and hydroseeded by EPA to minimize erosion.

Current Site Status

Based on approximately 100 soil and ground water samples collected by the REM II contractor on and near the site, the most likely routes of potential human exposure to contaminants are through the use of contaminated ground water and through direct contact with contaminated soil.

Figure 2 illustrates the approximate locations of the on-site soil samples. Table 1 summarizes the numbers of samples in which organic contaminants were detected, and the minimum, mean, and maximum concentrations of the contaminants. Organic compounds were detected in 90 percent of the shallow soil samples (19 of 21 samples), 93 percent of the test pit samples (28 of 30 samples), and all of the 17 soil-boring samples analyzed. The most commonly occurring compounds or chemical groups were phthalates, polynuclear aromatics, toluene, napthalene, PCBs, isophorone, carbon disulfide, and pesticides, In all, 50 different organic compounds were detected in at least one of the soil samples.

Table 2 summarizes the minimum, mean and maximum concentrations of inorganic compounds detected in the 73 soil samples. Of the 17 inorganic constituents analyzed for, 13 were detected in at least 85 percent of the samples, less commonly detected inorganics include beryllium, cadmium, mercury , and silver.

Three distinct water-bearing zones were identified underlying the site: A perched zone 10 to 40 feet deep; a semi-confined zone approximately 100 feet deep; and a second semi-confined zone approximately 130 feet deep.

The first water-bearing zone consists of the lower portion of the fill layer and a silty layer at the top of the Arundel clay. Ground water in this zone flows to the northeast at a rate between 0.2 and 11.8 feet/day. Ground water from the site may flow through a drainage culvert and a buried stream valley toward Herring Run. The ground water in the zone is somewhat contaminated by aliphatic (up to 67 ug/l) and aromatic (up to 647 ug/l) organics. The zone has been designated as a Class III A aquifer because it probably does not have a sufficient areal extent to provide an adequate yield for domestic water supplies.

The second water-bearing zone consists of a fine sand and sandy silt that probably represents the top of the Patuxent Formation. Ground water in this zone flows to the northeast at a rate between 0.01 and 0.1 foot/day. Recharge to the zone appears to come primarily from the southeast and west. The zone may be hydraulically connected to the first water bearing zone to the north and east. The ground water in this zone is somewhat contaminated by aliphatic (up to 72 ug/l) and aromatic (up to 126 ug/l) organics. The zone has been designated as a Class II B aquifer.

The third water-bearing zone consists of fine sand and silty sand of the Patuxent Formation. The direction and rate of ground-water flow in this zone were not determined as part of this RI. The third water-bearing may be hydraulically connected to the second water-bearing zone northeast of the site. No evidence of ground-water contamination was detected in the one well screened in this zone. The zone has been designated a a Class II B.

The alluvial deposits of Herring Run and other surface drainage ways downgradient of the site may be more extensive than previously thought. The alluvial deposits under Herring Run intercept the outcrop zone of the Patuxent Foundation and may allow contaminants to migrate to the Back River or to other areas of the Patuxent aquifer.

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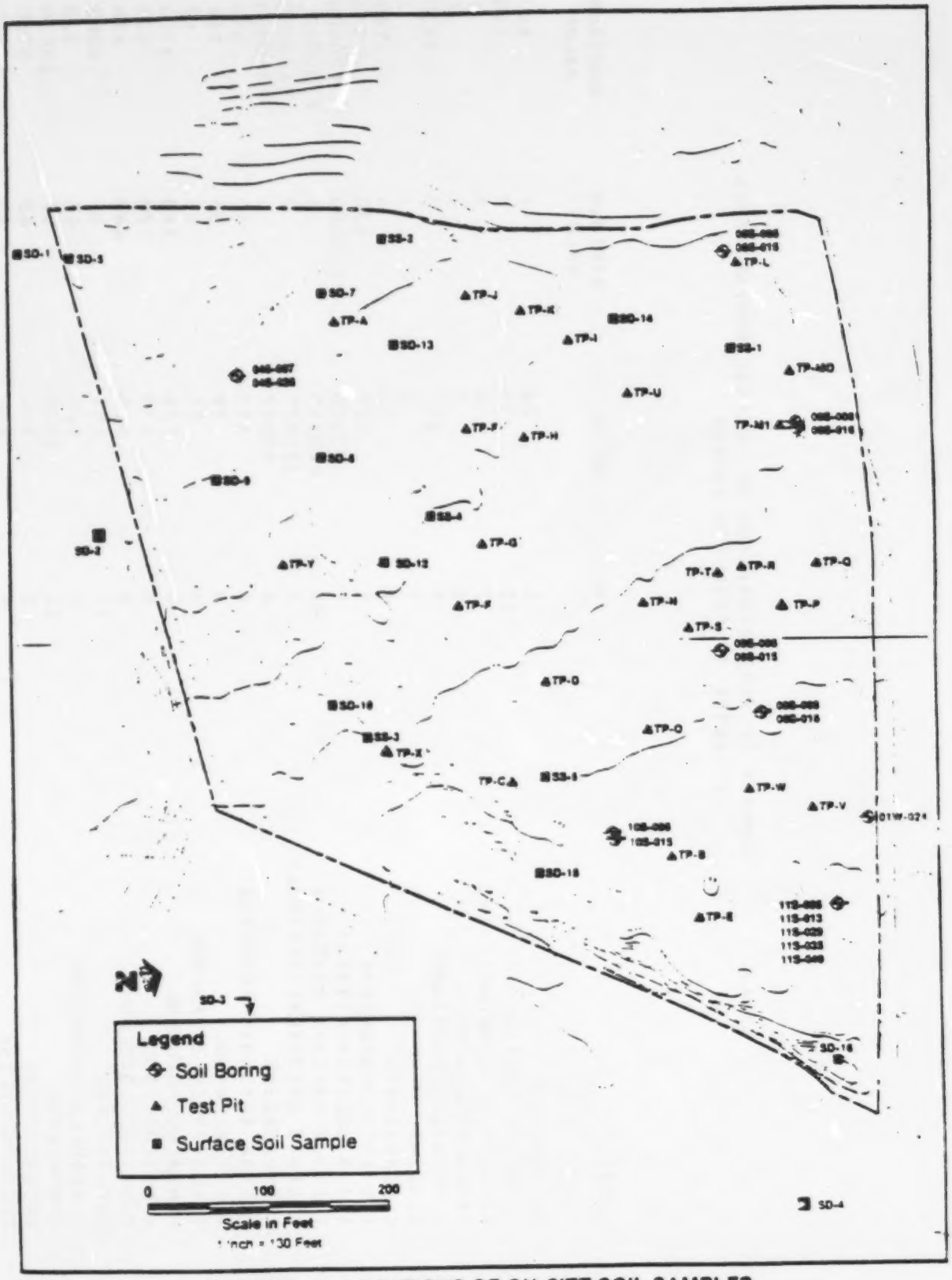

FIGURE 3 LOCATIONS OF ON-SITE SOIL SAMPLES

TABLE 1 SUMMARY OF CONCENTRATIONS OF ORGANIC CONTAMINANTS DETECTED IN SOIL (IN UG/KG)

LABEL	N	MEAN	MINIMUM VALUE	MAXIMUM VALUE
CHLOROFORM	6	28	1	140
CARBON DISULFIDE	12	30	2	310
TRANS-1,2-DICHLOROETHENE	2	4	2	6
TRICHLOROETHENE	1	2	2	2
4-METHYL-2-PENTANONE	3	603	5	1800
BENZENE	1	2	2	2
CHLOROBENZENE	7	51	3	180
1,4-DICHLOROBENZENE	1	570	570	570
3,3-DICHLOROBENZIDINE	1	120000	120000	120000
TOLUENE (METHYL BENZENE)	36	489195	1	17000000
XYLENES (DIMETHYL BENZENES)	7	255879	2	1400000
ETHYLBENZENE	6	80047	3	360000
PHENOL (HYDROXY BENZENE)	4	151	40	410
4-METHYLPHENOL	4	79	55	110
2,4,6-TRICHLOROPHENOL	1	53	53	53
PENTACHLOROPHENOL	4	528	140	1300
4-NITROPHENOL	1	570	570	570
2,6-DINITROTOLUENE	1	660	660	660
NAPHTHALENE	17	433	35	4000
2-METHYLNAPHTHALENE	7	124	42	320
ISOPHORONE	15	3708	47	27000
ACENAPHTHENE	7	914	62	5700
ACENAPHTHYLENE	7	250	34	740
ANTHRACENE	19	2088	33	20000
BENZO (A) ANTHRACENE	[illegible]	3517	32	[illegible]
DIBENZO (A,H) ANTHRACENE	[illegible]	1378	150	[illegible]
PHENANTHRENE	33	4175	34	72000
	[illegible]	[illegible]	[illegible]	45000

TABLE 1 SUMMARY OF CONCENTRATIONS OF ORGANIC CONTAMINANTS DETECTED IN SOIL (IN UG/KG)

LABEL	N	MEAN	MINIMUM VALUE	MAXIMUM VALUE
PYRENE (BENZO (D,E,F) PHENANTHRENE)	37	4421	32	84000
BENZO (A) PYRENE	30	2470	48	47000
INDENO 1,2,3(C,D) PYRENE	24	1839	48	26000
FLUORENE (2,3-BENZINDENE)	7	1917	60	6500
FLUORANTHENE	37	6124	28	120000
BENZO (B,K) FLUORANTHENE	30	4551	71	81000
BENZO (G,H,I) PERYLENE	21	1970	41	25000
DIBENZOFURAN	7	1121	41	4000
DIMETHYL PHTHALATE	1	190	190	190
DI-N-BUTYL PHTHALATE	25	1065	30	9600
BIS (2-ETHYLHEXYL) PHTHALATE	54	12143	44	270000
BUTYLBENZYL PHTHALATE	41	27925	44	940000
DI-N-OCTYL PHTHALATE	2	290	240	340
N-NITROSODIPHENYLAMINE	4	5300	1600	9300
DIELDRIN	2	47	45	48
4,4-DDE	1	63	63	63
4,4-DDD	1	160	160	160
4,4-DDT	4	66	24	92
CHLORDANE	6	358	20	1100
AROCHLOR 1248	10	3105	190	14000
AROCHLOR 1254	10	1458	61	7300
AROCHLOR 1260	1	1100	1100	1100

TABLE 3 . SUMMARY OF CONCENTRATIONS OF INORGANIC CONTAMINANTS DETECTED IN SOIL SAMPLES FROM TEST PITS (IN MG/KG)

LABEL	N	MEAN	MINIMUM VALUE	MAXIMUM VALUE
ALUMINUM	30	8746	1720	14700
ARSENIC	23	24	1	166
BARIUM	29	589	16	6370
BERYLLIUM	23	5	1	81
CADMIUM	16	11	3	89
CALCIUM	30	28312	152	221000
COBALT	29	17	2	59
COPPER	30	292	14	1790
CHROMIUM	30	247	4	1990
IRON	29	37283	2600	117000
LEAD	30	1084	7	13600
MAGNESIUM	30	1673	253	6810
MANGANESE	30	368	34	1220
MERCURY	19	1	0	2
NICKEL	30	377	9	4530
SILVER	3	8	2	17
SODIUM	30	501	19	3230
VANADIUM	30	75	4	413
ZINC	30	975	36	10300

Figure 3-1 and 3-2 depict locations of on-site and off-site monitor wells.

There is no immediate health threat to the community from ground-water since residents are supplied with drinking water by the City of Baltimore. Ground-water contamination may be an important issue relative to potential future use of the ground water underlying the site, and the potential effect of migration of contaminated ground water beyond the site boundaries.

The proximity of Patterson High School and recreational facilities makes direct contact exposures a potentially significant threat. This threat is reduced by the presence of the clay silt cap that covers most of the site and the fence which surrounds the site. Receptors related to the Francis Scott Key Medical Center and other nearby properties have more limited potential for direct contact exposure to contamination at the site.

Alternative Evaluation

The remedial action objectives arising from the public health evaluation are the following: (1) eliminate, or reduce to acceptable risk-based levels, soil contaminants which represent potential public health threats via direct exposure to the contaminated materials and (2) eliminate, or reduce to acceptable risk based levels, ground water contaminants which represent potential public health threats under the assumption of future consumptive use of the second water bearing zone underlying the site. Contaminants of concern include vinyl chloride, trichloroethylene, benzene, nickel, and cadmium. The first water bearing zone is not considered a potential source of drinking water. Of major importance to the second of these objectives is the possibility of regional ground water contamination, arising from the variety of other potential hazardous waste sites in the near vicinity of the Kane and Lombard property. A second major consideration is the fact that the Kane and Lombard site encompasses only a portion of the excavation/fill known to have existed in the area. As a result of the potential for other contributions to ground water contamination, this ROD is limited to consideration of source control technologies to reduce or eliminate the contribution of the Kane and Lombard site to regional problems.

Based on the above objectives, numerous source control alternatives were screened to provide a limited number of alternatives applicable for remedial actions at the site. Some of these alternatives were removed from further consideration based on site-specific information and other comparative criteria. These other criteria include: effectiveness, implementability and cost.

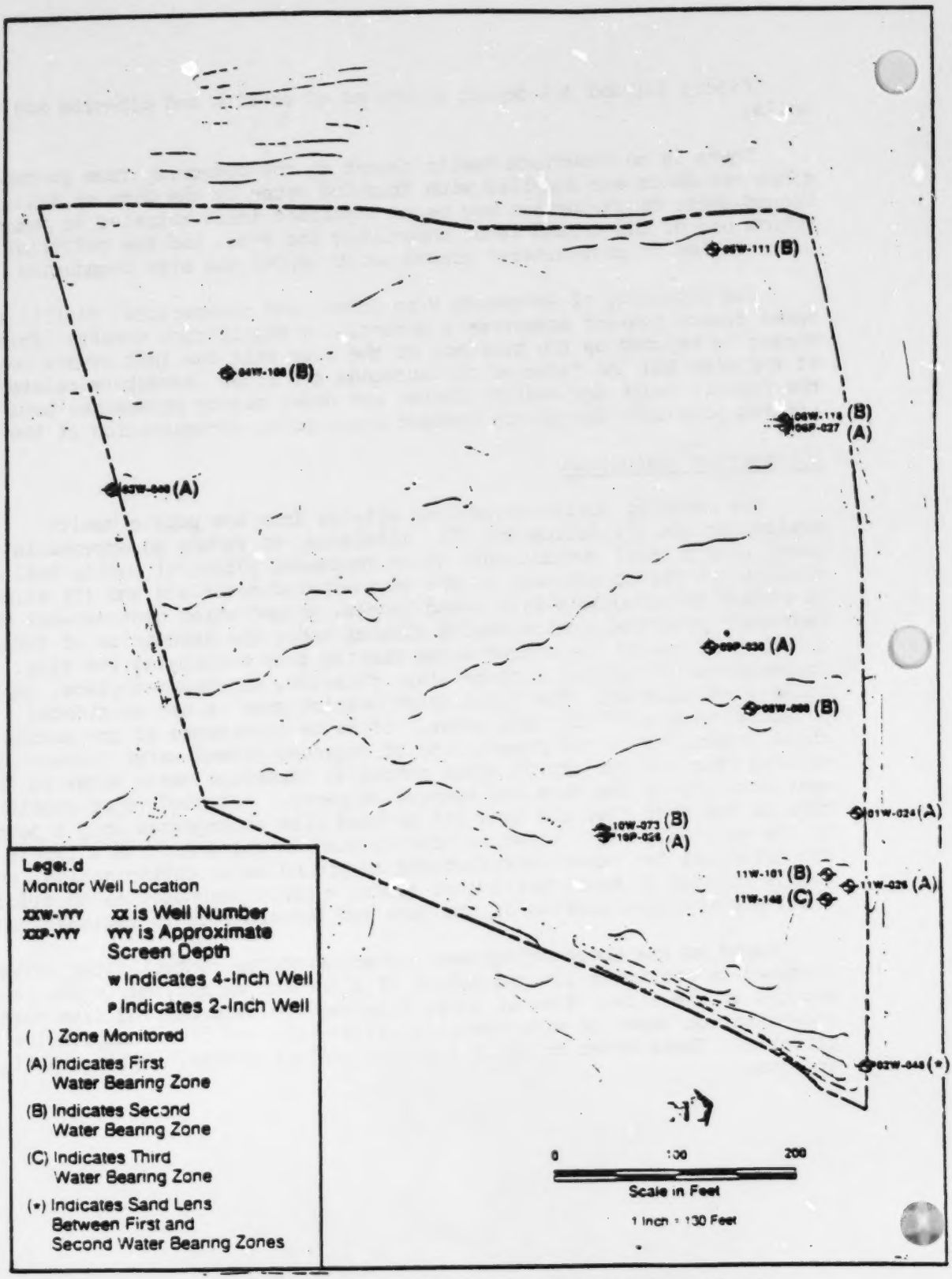
Legend
Monitor Well Location
XXW-YYY XX is Well Number
XXP-YYY YYY is Approximate Screen Depth
W Indicates 4-Inch Well
P Indicates 2-Inch Well
( ) Zone Monitored
(A) Indicates First Water Bearing Zone
(B) Indicates Second Water Bearing Zone
(C) Indicates Third Water Bearing Zone
(*) Indicates Sand Lens Between First and Second Water Bearing Zones
0
100
200
Scale in Feet
1 Inch = 100 Feet

FIGURE 3-1 LOCATIONS OF ON-SITE MONITOR WELLS

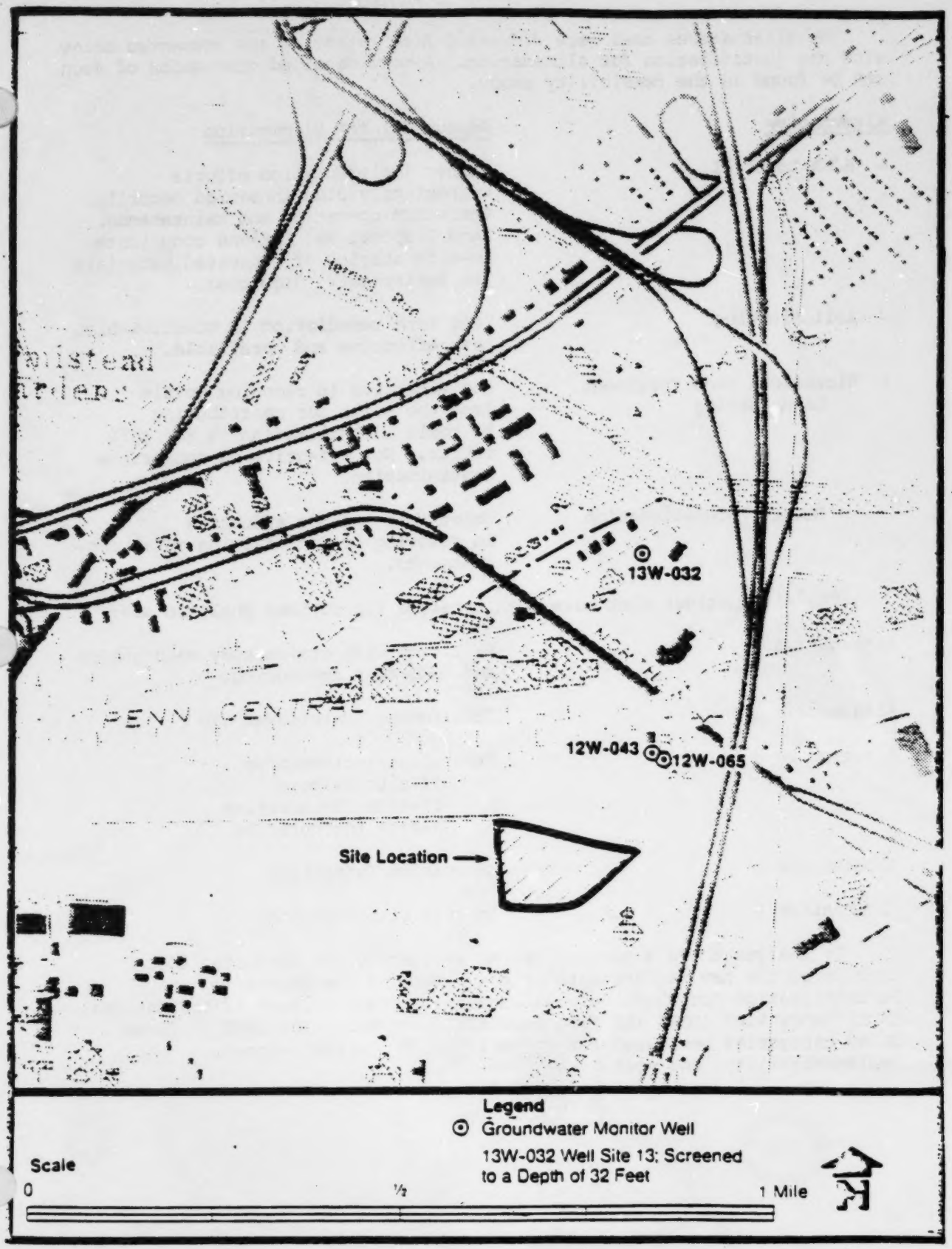

FIGURE 3-2 LOCATIONS OF OFF-SITE MONITOR WELLS

The alternatives that were dismissed from retention are presented below with the justification for elimination. A more detailed discussion of each can be found in the feasibility study.

Alternative	Reason (s) for Elimination
- RCRA Landfill	Higher implementation efforts without providing increased security. Long-term operation and maintenance. Land Disposal Regulations complicate on-site staging of excavated materials for redisposal. High cost.
- Soil Flushing	Long term remediation is questionable. Less effective and unreliable.
- Biological Land Treatment Land Farming	Not effective in removing metals from the soils nor contributing to their immobilization in the soil matrix. Not effective on subsurface contamination.
In-Site Bioreclamation	Unreliable and not effective in removing or immobilizing metal contaminants.

The alternatives that have been retained for further analysis are:

Alternative 1	No action with drainageway maintenance and long-term monitoring.
Alternative 2	Containment- Multilayer cap
Alternative 3	Excavation/Incineration a. Off-site disposal b. Off-site incineration c. On-site incineration
Alternative 4	Excavation/Extraction
Alternative 5	In situ Vitrification

To analyze these alternatives, an evaluation was conducted that considered the new requirements of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and the current version of the National Contingency Plan (NCP) (50 Fed. Reg. 47912, November 20, 1985). Three broad categories were used for the evaluation: effectiveness, implementability, and cost.

Within these categories there are factors that consider the short-term and long-term effects of each alternative. The evaluation is presented in detail in the Feasibility Study. The following is a summary of the evaluation:

Alternative 1. - No Further Action

The NCP requires that the no further action alternative be considered.

Implementability

Although designated as a no further action alternative, in that no remedial steps are taken with respect to the wastes remaining on-site, this alternative does include maintenance of the existing fence (which has been subject to damage) and cap (which has been subject to erosion) in order to prevent their deterioration and subsequent re-exposure of the wastes. In addition, the remaining waste materials and debris at the surface of the site (in the drainageway) are to be removed.

Under this alternative, waste materials would not be removed from the site, destroyed, or further immobilized. Waste would continue to contact, and presumably leach into, the first water bearing zone, and whatever degree of rain-water infiltration exists with the present cap would continue. Based upon observed erosion of the cap, its intergrity might be expected to diminish even with maintenance. Overall, this alternative will not be protective. It should be noted that all alternatives include these essential steps, although the monitoring period may vary.

Since no waste remediation measures will be implemented, technical feasibility and availability are not an issue.

Effectiveness

* The existing control strategies at the site do not meet RCRA Subtitle C criteria for containment and control of contaminants.

* The Public and the State opposed this alternative, since little, if any, reduction in environmental impacts could result. This opposition may be heightened because of the proximity of the site to housing, schools, and recreational areas.

* Long-term maintenance and post-closure effort.

* The no further action alternative would not reduce excess health risks.

* Implementation is not likely to result in the generation of additional ground water or air contamination, and thus should not impose any additional adverse public health or environmental impact.

* The effectiveness of the ground water monitoring program in evaluating impending changes in health risks is uncertain due to the potential presence of nearby off-site contaminant sources.

Cost

Capital Cost - $624,060
Present Worth* - $428,450
*Assumes 30 years maintenance (waste left in place).

The high cost for the disposal of debris arises from the assumption that these materials have been contaminated, for example, by runoff from the site, and therefore require disposal in a RCRA landfill. It may be that these materials could be disposed of in a Subtitle D landfill rather than a RCRA landfill. Unit cost for disposal in a nonhazardous fill are estimated to be $45 per cubic yard (as opposed to $203 per cubic yard for a RCRA land fill) resulting in maximum potential savings, for disposal of 2016 cubic yards, of approxiately $319,000. This would result in a total capital cost of approximately $225,000 rather than $624,060. This saving would be partly offset by expense incurred in sampling and testing of the debris and sediment which would be necessary to obtain acceptance at a nonhazardous landfill.

Alternative 2 - Containment

This alternative is based upon the concept of removing the remaining drums and hot spots of contaminated soils, and isolating the wastes, in place, from contact with ground and surface water, as a means of reducing or eliminating their contribution to water contamination. This alternative focuses upon positive actions to reduce the hazard posed by those wastes, by preventing their contact with water. Direct contact with the waste materials is prevented in essentially the same way as under the no action alternative, by site security measures; however, the importance of these controls is heightened by the need to maintain the integrity of the containment structures. The essential elements of this alternative include the following:

* Removal of drums and hot spots on site.

* Site cleaning and removal of vegetation to the extent necessary for construction of the necessary components.

* Construction of subsurface containment/diversion structures to both prevent the uncontrolled lateral migration of presently contaminated shallow ground water away from the site, and prevent the lateral recharge flow of uncontaminated ground water into the waste area.

* Construction of a multi-layer cap over the area to prevent the infiltration of precipitation and surface water into the waste area.

* Construction of a drainage system.

* Clearing of drainage ditch along the east side of the site.

* Development of necessary surface water runoff management facilities.

* Continued ground water monitoring of the site.

Implementability

* Construction of a subsurface barrier along the north boundary must consider continuing structural intergrity and chemical compatibility of the structure because of its construction through the waste. Furthermore, this barrier will be located in relatively close proximity to Lombard Street, and may be subjected to vibration from traffic. The potential for differential settlement and possible damage to the cap must also be considered. Cost for this construction may be more difficult to estimate because of the potential variations from ordinary barrier wall construction.

* Any of these cap options will improve the performance of the existing single-layer cover by exhibiting substantially lower permeability, and greater resistance to erosion.

* Necessary depths of barrier walls will run from 20 feet on the north boundary to approximately 55 feet on the south. These depths are within the range of constructability for such structures.

* The capacity of the existing stormwater drainage system, and consequently the requirement for on-site water storage, may require additional investigation.

Effectiveness

* To the extent that these measures prevent the migration of water through the site waste materials, this alternative can be expected to reduce significantly the ground water contamination arising from this source.

* Removal of the drums and hot spots will reduce the toxicity, mobility and volume on the site. The new cap will also constitute an additional physical barrier. Future use scenarios for the site are essentially obviated during the life of this action, and any such future use would have to readdress the ultimate decontamination and/or disposal of the fill materials.

* In terms of governmental and local acceptability, this alternative may represent a relatively conservative management approach, to on-site contamination particularly if implemented as part of a regional investigation into hazardous waste contamination. It will provide adequate containment and protection, at relatively lower cost, as compared to other alternatives (which likewise would not address off-site contaminant sources).

* Under this option, a relatively small amount of excavated wastes, from the barrier construction on the northern boundary, will remain for reburial. If these cannot be incorporated with the rest of the fill for capping, they will be disposed of off-site. Additional debris from the renovation of the drainage ditch will require disposal. Land Disposal Requirements concerning disposal might be applicable depending upon timeframe. If disposal occurs before November 1988, this will not be an issue.

* Short-term impacts likely to arise from this alternative will likely be limited to those associated with the construction activity itself, in terms of noise, odor, traffic and other nuisance conditions, and maybe considered minor.

* Long-term issues to consider include the need for periodic cap maintenance, management, potential ground water monitoring.

* Discharge of contaminated water from the first water bearing zone to the nearest publicly-owned treatment works via the city sewer system will require consultation with city and state agencies. The magnitude of these discharges should not be a problem, due to their small volumes and low concentrations.

* The implementation of the containment alternative can be expected to contribute to a reduction in the public health risk associated with direct contact with the wastes.

* Potential negative impact arises from the fact that the wastes are not permanently destroyed or immobilized, nor removed from the site.

* Cleaning of wooded areas on-site would detract from visual aesthetics of this site. However, limiting the cap to the areas of unacceptable contamination as shown in Figure 4, minimizes the disruption of existing vegetation, and reduces this impact.

Cost

Tables 3-1 and 3-2 summarize costs associated with this alternative.

Alternative 3 - Excavation/Thermal Treatment

The thermal treatment alternative would involve destruction of organic contaminants and separation of metals from the soils, and would likely be based upon rotary kiln technology. However, other configurations should also be considered in the design phase. The primary implementation options under this alternative would be (1) on-site incineration utilizing transportable kiln components which would be constructed and operated on-site for the duration of the cleanup effort, and (2) transportation of excavated materials to an off-site commercial RCRA incinerator facility. Included as a baseline in this overall alternative is the suboption of off-site disposal of all excavated materials. This permits comparison between the cost of treatment and the cost of direct redisposal. Other alternatives which involve treatment of excavated materials may also be compared to this baseline.

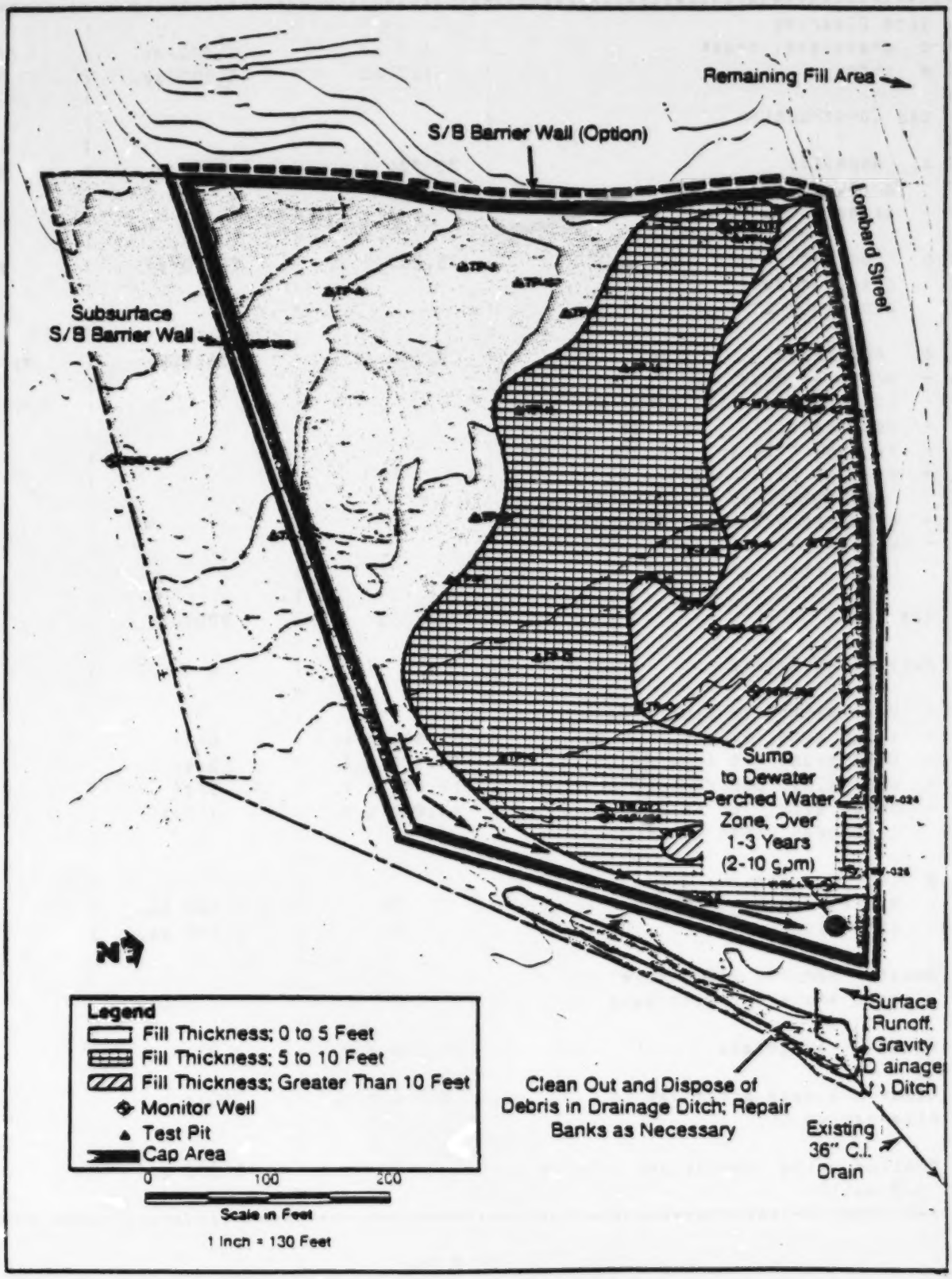

FIGURE 4 ALTERNATIVE 2 - CAP/BARRIER WALL CONTAINMENT

EM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $	
1	Site Clearing				
	o grassland, brush	6.1 ac.	1,500/ac.	$9,1[illegible]	(a,
	o trees	1.3 ac.	2,000/ac.	$2,[illegible]	(a,
2	Cap Construction				
	a. Asphalt:	35,500 s.y.	18/s.y.	$639,000	(b)
	granular base - 12"				
	asphalt - 6"				
	b. Concrete	35,500 s.y.	22.70/sy	$816,500	
	granular base - 12"				
	asphalt - 6"				
	c. Multilayer	35,500 s.y.	36/s.y.	$1,278,000	(a)
	- granular base, 12"				
	- low permeability soil, 24"				
	- (permeability < 10 cm/sec)				
	- synthetic liner, 320,000 s.f.				
	- drainge layer (sand), 12"				
	(permeability >10 cm/sec)				
	- geotextile fabric, 320,000 s.f.				
	- vegetative soil cover, 24"				
	(18" fill, 6" top soil)				
3	Gas Vents	12	500/ea.	$6,000	
4	Subsurface Barrier				
	o Soil/Bentonite Slurry Wall				
	- south side, 630 ft x 50 ft	31,500 s.f.	8/sf	$252,000	(a
	- east side, 410 ft x 35 ft	14,350 s.f.	8/sf	$114,800	(a
	- west side, 560 ft x 35 ft	19,600 s.f.	8/sf	$156,800	
	- north side, 750 ft x 20 f.t.	14,800 s.f.	11/sf	$162,800	(a
	(includes clean backfill)				
	o test borings				
	- south, east, north side	36	1,100 ea.	$39,600	(a
	- west side	11	1,100 ea.	$12,100	
5	Dewater perched water zone				
	- recovery sump, with pump	1	3,500	$3,500	(a
6	Reseed, revegetate	35,500 s.y.	1.80/s.y.	$63,900	(a
7	Clear drainage ditch (as in Alternative 1)	2,016 c.y.	203/c.y.	$409,250	(a
8	Monitor wells (inside and outside S/B wall)	20	5,000 ea.	$100,000	(a

TABLE 3-1

ALTERNATIVE 2 - PRELIMINARY ESTIMATE, CAPITAL COST -- CONTAINMENT

9c

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
	Engineering oversite personnel through implementation Phase (2 persons, 1 year)	4,000	$5/hr.	$180,000
10	Suboptions			
	Suboption a - Site clearing, multilayer cap, S/B wall on south, east, north sides, gas vents, dewatering of perched zone, revegetation, clear drainage ditch, monitor wells, engineer/oversight.			$2,621,600
	Suboption b - Site clearing, asphalt cap, S/B wall on south, east, north sides, gas vents, dewatering of perched zone, revegetation, clear drainage ditch, monitor wells, engineer/oversight.			$1,976,600
	Note: 1) For concrete cap, add $177,500 to suboption b. 2) For S/B well on west site, add $156,800 to either suboption.			
	Mobilization/Demobilization (22%) Construction management, site services			
	a. suboption a			$576,750
	b. suboption b			$434,850
12	Technology Implementation, designs, plans, specifications, regulatory approval, insurance bonds, permits (22%)			
	a. suboption a			$576,750
	b. suboption b			$434,850
13	Overhead and profit (10%)			
	a. suboption a			$262,160
	b. suboption b			$197,600
14	Contingency (25%)			
	a. suboption a			$655,400
	b. suboption b			$494,150
15	Total (rounded)			
	a. suboption a			$4,692,660
	b. suboption b			$3,538,100

a - item included in suboption a
b - item included in suboption b

TABLE 3-1 (continued)

ALTERNATIVE 2 - PRELIMINARY ESTIMATE OF OPERATING AND MAINTENANCE COSTS -- CONTAINMENT

9d

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
1	Security inspection, quarterly, 8 hr/cycle	32 hr.	35/hr.	$1[illegible]
2	Monitoring - 5 wells analytical 15 wells, water level only			
	o Labor: sampling 5 wells annually 30 hours per cycle	30 hr.	35/hr.	$1,050
	o Analytical: VOA/BNA/metals 5 wells plus blank/duplicate	7	950/ea	$6,650
	o Expenses, annual	Lump sum	500	$500
3	Maintenance			
	o Fence repair	250 ft/yr	6/ft	$1,500
	o Vegetation control	35,500/s.y.	0.24/s.y.	$8,520
4	Reporting/documentation			
	o Labor: quarterly inspection 2 hr/cycle	8 hr.	35/hr.	$280
	o Labor - annual ground water monitoring 24 hr/cycle	24 hr.	35/hr.	$[illegible]0
5	Operating power, removal of perched ground water			
	o electric usage rate	1600 kw-hr	0.063/kw-hr	$101
	o service connection		8.50/month	$102
6	Subtotal			$20,[illegible]00
7	Administrative (15%)			$3,100
8	Contingency (25%)			$5,170
9	ANNUAL TOTAL (rounded)			$28,930
10	Present worth*			$247,930

*Assumes 30 years maintenance (wastes left in place...
Remediation takes 1 year.

TABLE 3-λ

The thermal treatment technology would be expected to exceed source control cleanup criteria for the identified contaminants. However, depending upon the configuration of the kiln and accessory equipment, concern may arise over air emissions of volatile materials, including heavy metals. To some extent, such emissions will be controlled by flue-gas devices such as wet precipitators or baghouse filters.

As an alternative, one of the kiln-based innovative technologies, such as roasting, or chloride volatilization may be pursued further. The former would not separate metals from soils, but would immobilize them within. Since these are based upon rotary kiln technologies, their costs may, at a conceptual level, be expected to be only slightly higher than conventional incineration processes, due to the additional chemical or material handling equipment. However, substantial investigatory/pilot work would be necessary before selecting these alternatives.

All waste materials would be excavated under this alternative. Since excavation along Lombard Street will expose the face of the remainder of the fill which continues to the north, stabilization and capping of this face would be required, both as an interim protective measure during excavation, and to prevent future interaction between those wastes and the treated areas on-site. Temporary structural support of the exposed face may be required to prevent collapse of the road base.

The general outline to a thermal treatment for the Kane and Lombard site would include the following operations:

* Removal of the clean portion of existing cap, to be saved for re-burial.

* Excavation of fill, plus contaminated subsoils.

* Stabilization and capping of exposed fill along Lombard Street.

* Manual sorting (using construction equipment) of large debris from the fill (cement culverts, auto bodies) for separate landfill disposal. The materials must be removed prior to incineration to prevent damage to the kiln.

* Staging of excavated, pre-sorted material for processing.

* Mechanical shredding of materials (to $\leq$2") to facilitate their destruction in the incinerator.

* Thermal processing (incineration).

* Sampling of treated materials for residual contamination.

* On-site reburial of clean, treated materials; off-site RCRA landfill disposal of contaminated residues.

* Clearing of the drainage ditch along the east side of the site.

* Makeup backfill (including top soil), grading and vegetation.

While this evaluation is based primarily upon rotary kiln technology, there are other incineration processes under development which may warrant consideration in the implementation phase. One such process is the infrared incineration process which may present the capability for substantially higher throughput rates. Compatibility of this equipment with the wastes present at the Kane and Lombard site would require investigation.

Implementability

The ability of incineration to destroy organics identified at the Kane and Lombard site is reasonably certain. Of somewhat greater concern is the ability to recapture metals from the flue gas and prevent or minimize air emissions. The presence of chlorinated organics may also require the use of wet neutralization equipment (caustic scrubber) to minimize emissions. In sum, the basic incinerator would likely be supplemented by the incorporation of a secondary combustion chamber, caustic scrubber precipitation/baghouse filter and other appropriate devices. A trial burn would likely be needed to determine the nature of the off-gas, and obtain necessary air permits.

A major consideration in determining the feasibility and cost effectiveness of incineration is the material throughput rate of the system, and the BTU content of the material being burned. The on-site soil materials are likely to have a negligible BTU and high ash content and therefore may be a costly material to incinerate. Truly mobile (i.e., trailer mounted) systems are limited by the size of the incinerator itself and have limited capacity, on the order of tons of solid waste per hour. For this reason, a fairly large scale incineration project like the Kane and Lombard site would involve the erection on-site of transportable incinerator components; at the end of the project, the system would be disassembled and removed. Throughput rates in such a system may be in the area of five tons per hour. Permanent installation such as would exist at an off-site TSD facility would have substantially larger capacities. However, off-site incinerators may not accept bulk solids and repacking of materials in drums may be required. Furthermore, available capacity at some installations may be limited.

Excavation of the fill materials at the Kane and Lombard site will be complicated by the presence of large objects, such as concrete sections, known to have been buried. Such objects will not only make the actual excavation more difficult than would be the case with relatively homogeneous soils, but will also require pre-sorting and separate disposal. This factor will affect all alternatives which require excavation.

Due to the presence of the first water bearing zone, dewatering of the excavation may be required. Based on system throughput rates and prein-cineration materials handling requirements, actual implementation of this technology is expected to last approximately 3 years (post-construction).

Effectiveness

* This alternative might be expected to exceed the applicable SARA based source control criteria and result in permanent site remediation requiring relatively minimal post-remediation maintenance.

* Long-term involvement with the site after closure would be relatively limited.

* Short-term impacts are likely to arise from the incineration process itself, with respect to potential air emissions. The ability of the incinerator off-gas cleaning devices to meet applicable air emission standards should be addressed during the design and trial burn phases.

* Even with the probability of meeting air pollution standards, this alternative could meet with some degree of local or community opposition during the actual implementation. This opposition may be largely overcome by effective public education effort concerning the air emissions, and by demonstrating the permanent nature of the cleanup effort.

* Since this alternative results in the off-site disposal of at least some materials (the pre-sorted debris which cannot be incinerated), all such materials must go to a facility which is permitted and operated in accordance with Federal and State hazardous waste disposal regulations. Furthermore, the shipment of materials to those facilities must be performed in accordance with State and Federal Department of Transportation (DOT) regulations for shipment, handling, and tracking of hazardous wastes.

* This alternative is likely to result in localized, short-term impacts typical of a heavy construction project, with respect to odors, noise, and traffic. The excavation will cause short-term impacts with respect to dust, and water collection.

* This alternative should be expected to provide adequate protection of public health from hazards associated with direct contact with site materials. It can also be expected to effectively eliminate the contribution of this site to further ground water contamination; however, because of the presence of additional fill areas in the immediate vicinity, and the potential contribution of other hazardous waste sites in the area, the degree of improvement in ground water quality cannot be predicted at this time.

* In addition to the uncertain effectiveness with respect to ground water remediation, the potential exists for some negative impacts to arise if problems are encountered with air emissions.

* The contaminant levels and leachability characteristics of the ash produced from the incinerator must be considered in their disposal.

Cost

An evaluation of costs associated with this alternative is contained in Table 4-1 and 4-2.

Alternative 4. - Excavation/Extraction

This alternative involves excavation of contaminated fill materials followed by an extraction (soil washing) process to separate contaminants from the soil, leaving a product sufficiently decontaminated to permit on-site reburial. Implementation of this alternative would involve the following major operations:

* Removal of the clean portion of the existing cap, to be saved for reburial.
* Excavation of contaminated fill and subsoils.
* Staging of excavated materials in a cleared area of the site.
* Stabilization/capping of exposed fill face along Lombard Street.
* Presorting for removal of large debris and off-site disposal of debris. Debris removal is required to avoid damage to equipment.
* Screening/mechanical shredding to achieve uniform small fragments.
* Processing of shredded wastes in soil wash equipment.
* Treatment of wash streams by appropriate technology (such as reverse osmosis or carbon absorption). Wash water will be recycled to the wash process, with concentrate/regenerant stream to disposal.
* Sampling of washed materials to verify adequacy of treatment.
* On-site reburial of clean materials. Necessary makeup fill to be obtained off-site.
* Reburial of clean cap materials.
* Clearing of the drainage ditch along the east side of the site.
* Grading/Revegetation.

Implementability

* Should the sampling program indicate that contamination in some fractions has not been sufficiently reduced, off-site disposal may be required. Should the volume of such materials prove to be substantial, any potential advantage of this approach over direct excavation and disposal would likely be lost.

ALTERNATIVE 3 - PRELIMINARY ESTIMATE, CAPITAL COST -- EXCAVATION/INCINERATION

13a

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
1	Excavation			
	Clean overburden (cap) (save for reburial)	6050 c.y.	4/c.y.	$24,200
	Contaminated fill and subsoil	94,630 c.y.	5/c.y.	$473,150
2	Presort debris	4,730 c.y.	15/c.y.	$70,950
	Disposal in RCRA fill	4,730 c.y.	230/c.y.	$1,087,900
3	Fill disposal options (89,900 c.y. = 121,400 ton)			
	SUBOPTION A - OFF-SITE DISPOSAL			
	o disposal in off-site RCRA landfill	121,400 tons	173/ton	$21,002,200
	o backfill, clean fill	100,680 c.y.	12/c.y.	$1,208,160
	Subtotal Subption A			$22,210,360
	SUBOPTION B - OFF-SITE INCINERATION			
	o transport and incineration	121,400 tons	306/ton	$37,148,400
	o backfill, clean fill	100,680 c.y.	12/c.y.	$1,208,160
	Subtotal Option B			$38,356,560
	SUBOPTION C - ON-SITE INCINERATION			
	o Mechanical shredder, 15 t/hr.	121,400 tons	15/ton	$1,821,000
	o Incineration in transportable incinerator unit	121,400 tons	200/ton	$24,280,000
	o Off-site ash disposal (RCRA)	160 ton	173/ton	$27,680
	o Testing of incinerated waste for reburial, one sample per 500 c.y. (VOA/BNA/Metals)	200	1,000 ea.	$200,000
	o Reburial on-site of incinerated material (assumes 30% volume reduction on incineration)	62,900 c.y	5.00/c.y.	$314,500
	o Clean makeup fill	37,780 c.y.	12/c.y.	$453,360
	Subtotal Option C			$27,096,540
4	Cap/containment along Lombard Street fill face			
	Concrete or asphalt cap	8,000 s.y.	20/s.y.	$160,000
	Grading/Vegetation	6 ac.	8,700/ac	$52,200
6	Clear drainage ditch (as in Alternative 2)	2,016 c.y.	203/c.y.	$409,250

TABLE 4-1

ALTERNATIVE 3 - PRELIMINARY ESTIMATE, CAPITAL COST -- EXCAVATION/INCINERATION

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
7	Monitor wells	5	5,000 ea.	$25,000
8	Engineering oversite personnel through implementation phase (2 persons, 3 years each	12,000 hr.	45/hr.	$540,000
9	Subtotal (rounded) based upon fill disposal options (all other items common)			
	Suboption A - Off-site disposal			$24,982,100
	Suboption B - Off-site incineration			$41,199,200
	Suboption C - On-site incineration			$29,939,200
10	Mobilization/Demobilization (22%) Construction management, site services			
	a. Off-site disposal			$5,496,050
	b. Off-site incineration			$9,063,820
	c. On-site incineration			$6,586,620
11	Technology Implementation, designs, plans, specifications, regulatory approval, insurance bonds, permits (22%)			
	a. Off-site disposal			$5,496,050
	b. Off-site incineration			$9,063,820
	c. On-site incineration			$6,586,620
12	Overhead and Profit (10%)			
	a. Off-site disposal			$2,498,210
	b. Off-site incineration			$4,119,920
	c. On-site incineration			$2,993,920
13	Contingency (25%)			
	a. Off-site disposal			$6,245,525
	b. Off-site incineration			$10,299,800
	c. On-site incineration			$7,484,800
14	TOTAL (rounded)			
	a. Off-site disposal			$44,718,000
	b. Off-site incineration			$73,7[illegible]000
	c. On-site incineration			$53,5[illegible],000

TABLE 4- (continued)

NATIVE 3 - PRELIMINARY ESTIMATE OF OPERATING AND MAINTENANCE COSTS -- EXCAVATION/INCINER

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
1	Security inspection, quarterly 8 hr/	32 hr.	35/hr.	$1,120
2	Monitoring - 5 wells annually			
	o Labor: sampling 30 hours per cycle	30 hr.	35/hr.	$1,050
	o Analytical: VOA/BNA/metals 5 wells plus blank/duplicate	7	950/ea	$6,650
	o Expenses	Lump sum	500	$500
3	Maintenance			
	o Fence repair	250 ft/yr	6/ft	$1,500
	o Vegetation control	29,000 s.y.	0.24/s.y.	$6,970
4	Reporting/Documentation			
	o Labor: quarterly inspection 2 hr/cycle	8 hr.	35/hr.	$280
	o Labor - annual ground water monitoring 24 hr/cycle	24 hr.	35/hr.	$840
5	ANNUAL TOTAL (rounded)			$18,910
6	Present worth*			$50,3e0

*Assumes 5 yr maintenance, post-remediation; remedial phase takes 3 years.

TABLE 4-3

* The process will likely result in relatively small weight and volume reductions in the washed materials (on the order of 10% for contaminated soils washing) that would help to minimize the volume of makeup fill required; however, the total reduction in volume for fill may be somewhat larger due to the removal of debris during screening.

* The process will result in a volume of final discharge wash water for disposal. This water may be suitable for discharge to sewers. Remaining technical uncertainties with respect to necessary extraction solutions and effectiveness must be addressed in a pilot test program.

* Based on material processing rate and pre-wash materials handling requirements, the implementation phase of this technology is expected to last 2.5 to 3 years.

* Implementation of this process involves several relatively complex unit operations, including presorting and shredding, the wash process itself, the recovery and treatment of the wash solutions, and the need for testing of residual materials prior to reburial. The applicability of all of these steps to the types of wastes at the Kane and Lombard site should also be examined in the pilot program.

Effectiveness

* Soil washing/extraction has the potential for at least meeting, and possibly exceeding, soil cleanup criteria. It can also be expected to substantially reduce the contribution of the Kane and Lombard site to ground water concentrations of most of the identified contaminants; however, the possibility of achieving ground water cleanup goals by this action cannot be addressed.

* Treated soils may retain some low concentrations of contaminants and the wash solutions (solvents) may leach out in the future.

* While off-site reburial of some treated materials could conceivably be required, this treatment should approach the stated goal of reducing toxicity and/or volume of wastes considered for off-site disposal.

* The potential for relatively high process throughput rates may, depending upon the rates of other components (such as excavation and post-treatment sampling) help to reduce the overall length of the remediation effort and minimize impacts arising from that effort. These (short-term) impacts would primarily be those associated with the heavy construction of the work, with respect to noise, odor and traffic.

* As this technology results in permanent separation of wastes from the site, long-term impacts and issues are likely to be limited to any post-remediation monitoring required to assess ground water improvement and, detect recontamination by penetration of the barrier along the north boundary of the site.

* Off-site disposal of presorted debris, treatment process concentrate streams, and any unsuccessfully decontaminated wastes will require compliance with U.S. and State DOT requirements for handling, transport, and tracking of hazardous wastes. With conventional wash water treatment systems such as reverse osmosis or deionization, both the volumes and the concentrations of the concentrate/regenerant streams can be quite high, and disposal of these volumes can add to the cost and complexity of the project.

* Local discharge of final, treated, wash waters will require an NPDES or local sewer discharge approval.

* Since this alternative will result in removal of contaminants from the site, it may prove effective in minimizing future threats to public health and welfare arising from the Kane and Lombard site. However, the performance of the system in meeting clean-up goals should be demonstrated prior to implementation.

* Depending upon the contaminants and the solvents used, air (vapor) emissions from the process may have to be examined.

* The primary negative public health or environmental impacts which may arise from this alternative concern the redisposal of the contaminated wash solutions from the process.

Cost

Cost evaluation for implementation of this alternative is presented in Tables 5-1 and 5-2. While the soil wash process has been used at a limited number of installations, the technique is relatively new, and the cost of implementation at the Kane and Lombrad site may therefore be speculative.

Alternative 5. - In-Situ Treatment (Vitrification)

This alternative employs an innovative soil treatment technology, vitrification, in an attempt to achieve adequate containment or treatment of contaminants without the requirement for excavation of the waste and subsequent reburial/disposal and associated operations. Potential savings in time and expense, and reductions in operating hazards to be gained by eliminating these operations must be evaluated against potential total implementation/operating costs and uncertainties associated with the vitrification process. Since the process is still in an early stage of development, projected costs are somewhat uncertain. Furthermore, application of the process to the highly heterogeneous fill materials, would require investigatory and pilot studies, and the cost and time required for this development work should be considered.

ALTERNATIVE 4 - PRELIMINARY ESTIMATE, CAPITAL COST -- EXCAVATION/EXTRACTION

DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
Excavation			
o Clean overburden (cap) (save for reburial)	6,050 c.y.	4.00/c.y.	$24,200
o Contaminated fill and subsoil	94,630 c.y.	5.00/c.y.	$473,150
Preosort debris	4,730 c.y.	15.00/c.y.	$70,950
Dispose in RCRA fill	4,730 c.y.	230/c.y.	$1,104,690
Soil Wash (89,900 cy = 12400 tons)			
Laboratory evaluation and process developement			
- Laboratory scale	Lump sum		$150,000
- Pilot scale	Lump sum		$150,000
o mechanical shredding, 15 ton/hr (to avoid equipment damage and increase contact between solvent and contaminants)	Lump Sum 121,400 tons	15/tons	$1,821,000
Soil wash process, 89,900 cy	89,900 c.y.	95/c.y.	$8,540,500
o includes treatment/recycle of wash solution and disposal of concentrate/regenerant solution. Approximately 100 cy/day			
Disposal of treated material			
o testing of washed material, one sample per 500 c.y. Sample and analyse for VOA/BNA/metals (incl. blanks)	200	1,000 ea.	$200,000
Backfill			
o reburial of washed soil (assumes 10% volume reduction)	80,900 c.y.	5/c.y.	$404,500
o reburial of cap	,050 c.y.	5/c.y.	$30,250
o clean makeup fill	13,370 c.y.	12/c.y.	$164,760
Cap/containment along Lombard Street fill face			
o concrete or asphalt cap	8,000 s.y.	20/s.y.	$160,000
Grading/Vegetation	6 ac.	8,700/ac.	$52,200
Clear drainage ditch (as in Alternative 1)	2,016 c.y.	203/c.y.	$409,250

ALTERNATIVE 4 - PRELIMINARY ESTIMATE, CAPITAL COST -- EXCAVATION/EXTRACTION

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
9	Monitor wells	5	5,000 ea.	$25,000
10	Engineering/oversite personnel through implementation in phase (2 persons, 3 years each)	12,000 hr	45/hr	$540,000
11	Subtotal			$14,320,450
12	Mobilization/Demobilization (22%) Construction management, site services			$3,150,500
13	Technology Implementation, designs, plans, specifications, regulatory approval, insurance bonds, permits (22%)			$3,150,500
14	Overhead and Profit (10%)			$1,432,450
15	Contingency (25%)			$3,580,110
	TOTAL (rounded)			$25,634,000

TABLE 5-1 (continued)

LTERNATIVE 4 - PRELIMINARY ESTIMATE OF OPERATING AND MAINTENANCE COSTS -- EXCAVATION/EXTRACTI

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
1	Security inspection, quarterly, 8 hr	32 hr	35/hr	$1,120
2	Monitoring - 5 wells annually			
	o Labor: sampling, 30 hours per cycl	30 hr	35/hr	$1,050
	o Analytical: VOA/BNA/metals 5 wells plus blank/duplicate	7	950/ea	$6,650
	o Expenses, annual	Lump sum	500	$500
3	Maintenance			
	o Fence repair	250 ft/yr	6/ft	$1,500
	o Vegetation control	29,000 s.y.	0.24/sy	$6,970
4	Reporting/Documentation			
	o Labor: quarterly inspection 2 hr/cycle	8 hr.	35/hr.	$
	o Labor - annual ground water monitoring 24 hr/cycle	24 hr.	35/hr.	$840
5	ANNUAL TOTAL (rounded)			$18,910
6	Present worth*			$53,360

Assumes 5 yr maintenance, post remediation; remedial phase takes 3 years.

TABLE 5-3

The treatment to be achieved by in-situ vitrification consists of immobilization of metals within a crystalline matrix, and volatilization, followed by combustion/oxidation, of organics. The actual performance of the process in capture/destruction of organics must be demonstrated prior to implementation.

Implementation of this alternative involves the following steps:

* Removal of clean portion of existing cap, saved for replacement.

* In-situ vitrification of contaminated fill area, extending into subsoil layer.

* Replacement of clean cap materials, plus makeup fill and cover soil as required.

* Grading/vegetation.

Implementability

Literature reports indicate that vitrification of contaminated soils results in the formation of a stable glasslike and crystalline mass which is quite resistant to leaching and weathering (Oma, et al, 1983). It should therefore, in such applications, result in an essentially permanent remedial technology, as long as no future use of the property would require excavation.

Testing has demonstrated that the ISV process is effective at depths up to 10-13 meters (33 to 43 feet) (Oma et al, 1983) which is adequate for the wastes at the Kane and Lombard site. A major uncertainty in the application of ISV or any in-situ process to material like that at the Kane and Lombard site involves the heterogeneity of the materials and the capability of the technology to deal with void spaces and discontinuities. Literature reports indicate that in-situ vitrification is not significantly affected by metal inclusions unless a full electrical short circuit occurs, and metal fractions as high as 5% of the total weight may be accommodated. Cement and concrete inclusions are reported to dissolve in the melt. Vitrification of soil containing sealed containers (e.g., drums) resulted in breaching of the container and release of gas to be captured in the ISV offgas hood (Oma et al, 1983; Fitzpatrick, 1987a). More recent results indicate that large void spaces may be accommodated, apparently by coalescence of the melt zone into the void (Fitzpatrick, 1987b).

The existence of the shallow water table in the base of the fill may affect ISV operations. Energy requirements and cost will increase due to the necessity for evaporating this moisture. If an electrical short circuit is achieved the process will be compromised.

The equipment for ISV has apparently functioned well during testing. However, operations on the scale necessary at the Kane and Lombard site have apparently not been demonstrated.

Operational cautions which should be considered in the implementation of ISV may include potential for accidental gas release due to hood failure, and precautions associated with high temperature and high voltage equipment.

Current information on the processing rate for vitrification indicates that complete vitrification of the Kane and Lombard site, assuming 24 hours/day of operation, would take 4.5 years.

While research and pilot testing of this process indicates promise for application in heterogeneous materials it has not been demonstrated for highly heterogeneous landfill materials such as are present at the Kane and Lombard site. Substantial development work will be required prior to this selection of this option.

Effectiveness

* This alternative is likely to achieve or exceed cleanup levels for organics in soil, and will substantially reduce contribution of all contaminants (organics and metals) to ground water; as with other options, the degree of ground water remediation to be achieved is difficult to quantify. The immobilization of metals in the crystalline matrix will reduce incidental exposure to these contaminants, but any future use such as construction which requires excavation of the material may result in some hazard. The native of the solidified mass may itself obviate such future use.

* Government and local opposition to this alternative as a long term solution would likely be limited to concern over long-term prohibition of future land use, as with certain other options. Long-term impact in terms of maintenance monitoring or surveillance should be relatively low.

* Short term impacts on the surrounding community would be those related to construction activities at the site (noise, odor, traffic).

* Materials likely to be transported off-site under this alternative would be limited to the debris removal to clean out the existing drainage ditch. These materials would, unless sampling could establish otherwise, be handled as hazardous and therefore be subject to federal and state DOT regulations.

* This alternative would appear to provide adequate long-term protection of public health and the environment, so long as the solidified mass is left intact and in place.

* As long as air emissions from the off-gas hood are effectively and consistently controlled, the degree of short-term (implementation phase) hazard to public health and the environment should not be excessive.

Cost

Cost evaluation for implementation of this alternative is contained in Tables 6-1 and 6-2. Cost for the actual vitrification process have been developed from vendor contact, and should be considered speculative in the absence of testing and detailed treatability analysis.

Recommended Alternative

Section 121 of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and the current version of the National Contingency Plan (NCP) (50 Fed Reg. 47912, November 20, 1985) establishes a variety of requirements relating to the level of cleanup for remedial actions under CERLCA. Applying the current evaluation criteria (implementability, effectiveness, and cost that was previously described under each of the five alternatives), we recommend that Alternative 2 be implemented at the Kane and Lombard Superfund Site.

This remedy is a source control action for the site. Ground water in the area will be deferred in this Record of Decision until further investigations on other potential sites in the nearby area are concluded. This remedy does not attempt to ensure compliance with all ARARs for the entire site, but will be consistant, to the extent practicable, with those action specific ARARs. CERCLA § 121 provides that under certain circumstances an otherwise applicable or relevant and appropriate requirement can be waived. These waivers apply only to the attainment of the ARAR, other statutory requirements, such as that remedies be protective of human health and the environment, cannot be waived. CERCLA § 121 (d)(4) provides waivers which were considered in recommending this alternative. The following waivers are applicable to this site: 1) interim remedy; 2) greater risk to health or the environment, 3) technical impracability and 4) fund balancing.

Alternative 2 is a source control remedy and can be viewed as an interim remedy because ground water in the second and third water-bearing zones are not addressed. As stated previously, the ground water in this area will be addressed at the conclusion of the investigation of other potential sources.

Alternatives 3,4 and 5 possibly provide permanent solutions to the site; however, the risk associated with the implementation of these alternatives provides a greater risk to the health and the environment via air emissions than the implementation of Alternative 2.

Due to the enormous amount of construction material and debris buried on-site, total excavation required under Alternatives 3,4 and 5 would be technically impracticable and costly. Alternative 2 will focus on removing selected hot spots identified in the geophysical survey and sampling analyses, versus the entire site and is less costly.

Table 8 lists statutory requirements and ARARs applicable to Alternative 2.

ALTERNATIVE 5 - PRELIMINARY ESTIMATE, CAPITAL COST -- IN SITU VITRIFICATION

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
1	Site preparation			
	Remove clean overburden (cap) (Save for reburial)	6,050 c.y.	4/c.y.	$24,200
2	Vitrification process			
	Laboaratory Evaluation and Process Developeent	Lump Sum		
	- laboratory scale	Lump sum		$150,000
	- pilot scale	Lump sum		$150,000
	Vitrification processing	94,630 c.y.	270/c.y.	$25,550,100
3	Reburial of overburden (cap)	6,050 c.y.	5.00/c.y.	$30,250
4	Makeup fill, plus soil cover, 2 ft. total	19,400 c.y.	15/c.y.	$291,000
5	Grading/vegetation	6 ac.	8,700/ac.	$52,[illegible]
6	Clear drainage ditch (as in Alternative 1)	2,016 c.y.	203/c.y.	$409,250
7	Monitor wells	5	5,000/ea.	$25,000
8	Engineering/oversite personnel, through implementation phase, (2 persons, 5 years ea.)	20,000 hr.	45/hr.	$900,000
9	Subtotal			$27,592,000
10	Mobilization/Demobilization (22%) Construction management, site services			$6,070,240
11	Technology Implementation, designs, plans, specifications, regulatory approval, insurance bonds, permits (22%)			$6,070,240
12	Overhead and profit (10%)			$2,759,200
13	Contingency (25%)			$6,899,[illegible]
15	TOTAL (rounded)			$49,389,700

TABLE 6-1

RNATIVE 5 - PRELIMINARY ESTIMATE OF OPERATING AND MAINTENANCE COSTS -- IN SITU VITRIFICA

ITEM	DESCRIPTION	QUANTITY	UNIT COST, $	TOTAL COST, $
1	Security inspection, quarterly, 8 hr	32 hr.	35/hr.	$1,120
2	Monitoring - 5 wells annually		-	
	o Labor: sampling, 30 hours per cycl	30 hr.	35/hr.	$1,050
	o Analytical: VOA/BNA/metals 5 wells plus blank/duplicate	7	950/ea	$6,650
	o Expenses, annual	Lump sum	500	$500
3	Maintenance			
	o Fence repair	250 ft/yr	6/ft	$1,500
	o Vegetation control	29,000 s.y.	0.24/sy	$6,970
	Reporting/Documentation			
	o Labor: quarterly inspection 2 hr/cycle	8 hr.	35/hr.	$280
	o Labor - annual ground water monitoring, 24 hr/cycle	24 hr.	35/hr.	$840
5	ANNUAL TOTAL (rounded)			$13,910
6	Present worth*			--,---

*Assuues 5 yr maintenance, post-reseediation, reseedial phase takes 5 years.

TABLE 6-3

This alternative consists of the following:

* Removal of drums and hot spots contaminated soil on the site.

* Site cleaning and removal of vegetation to the extent necessary for construction of the necessary components.

* Construction of subsurface containment/diversion structures to both prevent the uncontrolled lateral migration of presently contaminated shallow ground water from the site, and prevent the lateral recharge flow of uncontaminated ground water into the waste area.

* Construction of a multilayer soil cap over the area to prevent the infiltration of precipitation and surface water into the waste area.

* Construction of a drainage system.

* Clearing of drainage ditch along the east side of the site.

* Development of necessay surface water runoff management facilities.

* Continued ground water monitoring of the site.

The conceptual development of this alternative is presented in Figure 4. This configuration has been developed to provide, to the extent possible, complete on-site management of surface water.

Along the eastern boundary of the fill, ground water containment is provided by the subsurface slurry wall. Along the north boundary (Lombard Street) a similar subsurface barrier is used.

In this region, however, the wall must be constructed through fill materials, which complicates the construction process itself, involves uncertainites regarding wall continuity, and raises concerns over its long-term physical and chemical intergrity. However, there are a variety of complications and unknowns which should be considered. These include the increased amount of excavation required to work around buried objects, the unknown additional slurry which may be needed to achieve an effective seal in the porous fill, and the requirement for disposal of wastes excavated from the trench and their replacement with imported fill (as opposed to the more common reuse of trench excavated as backfill). These complications introduce additional uncertainties into the cost estimates. While other subsurface structures (diaphram or piling walls) may provide greater structural rigidity in this area, they may also involve significantly higher permeabilities.

Along the south side, the subsurface containment structure has been extended to the southwest in such a way as to tie into the topography in in the Southwestern corner and divert all ground water, entering from the southwest, to the northeast, generally similar to its natural flow.

Following construction of the subsurface containment/diversion system, the site will be capped to prevent infiltration of precipitation. Cap construction will include the construction of drainage channels and appropriate grading to direct runoff to the east for discharge in the existing drainage ditch along the eastern boundary.

The first water bearing zone contained within the site will be dewatered by the placement of a shallow sump in the northeast area of the confined zone, to intercept this water as it flows naturally to the northeast. A new cap system and subsurface barrier/wall will minimize entry into the site and the shallow sump will withdraw existing water from the shallow zone. Current evidence indicates that this zone will drain, over a period of years at a declining rate. Since this water is contaminated it will not be discharged directly to the surface or storm sewers. The preferential disposition for this relatively small flow would be discharge to the sanitary sewer system and hence to the municipal waste water treatment plant, under an agreement with the city. This proposal has been discussed with the state and the city.

Comparison of Remedial Alternative

Table 7 provides a comparison of the five remedial alternatives described in the ROD.

Schedule

Concurrence of ROD	September 1987
Negotiations with PRPs	October 1987 - December 1987
Initiate Design Phase	January 1988
Complete Design	June 1988
Initiate Construction	August 1988

TABLE 7

ALTERNATIVE	PRESENT WORTH COST $ (THOUSANDS)	TECHNICAL CONSIDERATIONS	INSTITUTIONAL CONSIDERATIONS	PUBLIC HEALTH/ ENVIRONMENTAL ISSUES	COMMENT
No Action	$1,053	Technical implementation is straightforward Continuing monitoring/ security program is required. Interpretation of monitoring well data, and evaluation of changes in ground water conditions is complicated by potential for off-site contaminant sources.	Under SARA guidelines controls which do not meet applicable requirements may be acceptable as an interim measure. Requires technical, administrative, and economic commitment to protracted, though relatively conventional monitoring program. Public opposition may be encountered since no reduction in existing hazards is anticipated; opposition may be lessened if implemented as part of a regional program.	No significant reduction in excess health risks, except any occurring via natural attenuation, would be expected. Implementation would not likely result in significant interim ground water or air environmental impact.	Does not achieve applicable clean-up criteria.
Containment	$3,786 to $4,941	Implementation/constructability of certain aspects (subsurface controls) is complicated by site conditions: o Required depth, particularly upgradient. o Necessity to install structure through portions of landfill materials. Capping technology is relatively straight forward Implementation will involve several years of periodic maintenance for contaminated ground water drainage system, and may involve additional maintenance if stormwater or uncontaminated ground water management is required. Some amount of off-site disposal of excavated materials may be required.	Potential permits required: o Discharge of contaminated water from first water bearing zone under NPDES or municipal POTW discharge standards. o Discharge of collected storm or ground water volumes in excess of 10,000 gpd may require permit under Code of Maryland Regulations 10.50.01. o Applicable stormwater management policy requires consideration. o Off-site disposal of contaminated materials requires compliance with US and Maryland DOT regulations.	Should reduce significantly that contamination of ground water which arise from the Kane and Lombard site, but effect on eventual ground water quality is difficult to predict. Reduction in health threat from direct contact (construction use scenario) arises only from limited access to site and wastes, as in no action alternative. Relatively little potential for adverse public health or environmental impact during implementation phase. Any failure in long term integrity of containment structures may result in recontamination of site and/or ground water.	Does not address soil clean-up criteria. Will likely contribute to reduction in future input of contaminants to ground water.
Thermal Treatment	$44,772 to $73,801	Applicability of incineration for the destruction of organics is reasonably certain; potential air emissions due to volatilization of metals must be addressed. Alternative processes which immobilize metals or intentionally volatilize metals for subsequent recapture, are as yet unproven. Constructability of on site incinerator is feasible, but relatively low through put capacity imposed by size limitation may result in protracted clean-up effort	Operation of a on-site incinerator requries compliance with Federal and State air quality regulations (Code of Maryland 10.18.01) for air quality and incinerator operations. Thermal destruction of PCB's must be in accordance with Toxic Substance Control Act (15 USC 2601) and Maryland Regulations for Disposal of Contrailed Hazardous Substances (Code of Maryland 10.51.07). Off-site disposal of some materials requires compliance with US and Maryland DOT regulations.	Should result in essentially complete, permanent removal/destruction of contaminants, exceeding soil clean-up goals and reducing input of contaminants to ground water; effect on ultimate ground water quality difficult to predict. Potential for negative impacts arising from air emissions from incineration. Periods of open excavation and storage of staged materials on surface requires management of run-off or air emissions of contaminants.	Likely to exceed soil clean-up criteria, likely to substantially reduce contamination of ground water from Kane and Lombard site.

TABLE 7

ALTERNATIVE	PRESENT WORTH COST $ (THOUSANDS)	TECHNICAL CONSIDERATIONS	INSTITUTIONAL CONSIDERATIONS	PUBLIC HEALTH/ ENVIRONMENTAL ISSUES	COMMENT
Thermal Treatment (continued)		Substantial pre-sorting and shredding, as well as materials handling/staging complicates clean-up effort. Exposed face of existing fill along Lombard Street requires stabilization/capping. Sampling required to verify suitability for reburial of residuals.	Implementation phase may result in some local or community opposition. Should result in permanent resolution of contamination problem, provided integrity of containment along Lombard Street is maintained.		
Extraction	$25,680	Proprietary processes are avilable which should be applicable for chemical extraction of contaminants from soils, simplifying implementation. Vendors process schemes include treatment of contaminated wash solutions. Processes rely upon known technologies derived from mining and oil recovery businesses. Pilot testing required. Substantial pre-sorting and shredding, as well as materials handling/staging complicates clean-up effort. Exposed face of existing fill along Lombard Street requires stabilization/capping. Sampling required to verify suitability for reburial of residuals. Length of remedial effort depends on process through put rate selected, may be several years. On-site reburial may result in continued contact of residual contaminants with first water-bearing zone.	Final washwater requires disposal; vendor literature indicates discharge to sewer may be technically feasible. Discharge permit may be required. Off-site reburial of some treated materials requries compliance with US and Maryland DOT regulations. Should result in permanent resolution of contamination problem, provided integrity of containment along Lombard Street is maintained. Little potential for local opposition during implementation phase.	Should result in permanent reduction in public health threat through direct contact route; effect on public health threat from ground water is unknown. Relatively little potential for negative public threat or environmental impact during implementation, provided contaminated wash water are managed appropriately. Periods of open excavation and storage of staged materials on surface requries management of run-off and air emissions of contaminants.	Likely to meet or exceed soil clean-up criteria likely to substantially reduce contamination of ground water from Kane and Lombard site.

TABLE 7

ALTERNATIVE	PRESENT WORTH COST $ (THOUSANDS)	TECHNICAL CONSIDERATIONS	INSTITUTIONAL CONSIDERATIONS	PUBLIC HEALTH/ ENVIRONMENTAL ISSUES	COMMENT
In-situ Treatment (Vitrification)	$49,434	Innovative treatment available as a potential process from vendor. Has potential for effective immobilization of metals and volatilization/pyrolysis of organics. Has some potential for treating heterogeneous materials and those containing void spaces. Volatilized organics captured in hood to avoid air r[illegible] esau. Pilot testing required. Implementation phase likely to take several years depending upon size of system.	Likely to meet or exceed organic clean-up criteria in soil, but will not reduce metal contaminants. Effect on ground water criteria unknown. Should result in relatively permanent resolution of existing contamination. While hood is used to collect off gases, any releases must comply with Federal and state air pollution regulations (Code of Maryland 10.18.01). Thermal treatment of PCB-containing material may require compliance with TSCA and Code of Maryland 10.51.07. Off-site disposal of some materials requries compliance with U.S. and Maryland DOT regulation. Implementation phase may result in public concern/opposition due to unconventional technology and concern over air release. Implementation would likely preclude any future construction use of property.	Should result in permanent reduction in public health threat through direct contact route (although future construction is precluded in any event), effect on public health threat from ground water is unknown. Potential for accidental release of gas, resulting in negative impact, is slight. Future use of site is substantially restricted due to inability/difficulty in excavating vitrified mass.	Likely to meet or exceed organic clean-up criteria in soil; metals levels unchanged. Likely to substantially reduce contamination of ground water from F & L site.

Table 8
Selected Action - Specific Probable ARAR Requirements
for Alternative 2 - Recommended Alternative
for the Kane and Lombard Site

Action	Requirements	Citation
Capping 264.228 (a)	Placement of a cap over waste requires a cover designed and constructed to:	40 CFR 264.310 (a)
	° Provide long-term minimization migration of liquids through the capped area;	
	° Function with minimum maintenance;	
	° Promote drainage and minimize erosion or abrasion of the cover;	
	° Accomodate settling and subsidence so that the cover's integrity is maintained; and	
	° Have a permeability less than or equal to the permeability of any bottom liner system or natural sub-soils present.	
	° Restrict post-closure use of property as necessary to prevent damage to the cover.	40 CFR 264.117 (a)
	° Prevent run-on and run-off from damaging cover.	40 CFR 264.228 (b) 40 CFR 264.310 (b)
Closure with waste in place (Hybrid Closure)	Removal of contaminated materials.	52 FR 8712 (March 19, 1987)
	Application of cover and post-closure monitoring based on exposure pathway(s) of concern.	52 FR 8712 (March 19, 1987)

Table 9 Continued

Action	Requirements	Citation
Consolidation	Placement on or in land outside unit boundary or area of contamination will trigger land disposal requirements and restrictions.	40 CFR 268 (Subpart D)
Removal of drums and contaminated "hot spot" areas.	* Land Disposal Restriction The selected remedy involves placement and treatment of soils and debris wastes. Placement of wastes or treated residuals is prohibited under RCRA Land Disposal Restrictions (LDR) unless certain treatment standards are met. LDR standards have not been promulgated for soil and debris wastes, but when published, the standards may be applicable or relevant and appropriate. Despite the absence of specific treatment standards, the treatment method employed as part of this remedial action satisfies the statutory requirement to, "... substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized." [sec. 3004 (m) H.S.W.A.]	
Discharge to POTW	Pollutants that pass-through the POTW without treatment, interfere with POTW operation, or contaminate POTW sludge are prohibited. Specific prohibitions preclude the discharge of pollutants to POTWs that: ° Create a fire or explosion hazard in the POTW; ° Are corrosive (pH < 5.0); ° Obstruct flow resulting in interference; ° Are discharged at a flow rate and/or concentration that will result in interference, and ° Increase the temperature of wastewater entering the treatment plant that would	40 CFR 403.5

Table 8 Continued

Action	Requirements	Citation
	result in interference, but in no case raise the POTW influent temperature above 104° F (40°C).	
	° Discharge must comply with local POTW pretreatment program, including POTW-specific pollutants, spill prevention program requirements, and reporting and monitoring requirements.	40 CFR 403.5 and local POTW regulations.
	° RCRA permit-by-rule requirements must be compiled with for discharges of RCRA hazardous wastes to POTWs by truck, rail, or dedicted pipe.	40 CFR 268 (Subpart D)
Ground-water Diversion (Slurry Wall)	Excavation of soil for construction of slurry wall may trigger cleanup or land disposal restrictions.	40 CFR 268 (Subpart D)
Operation and maintenance (O & M)	Post-closure care to ensure that the site is maintained and monitored.	40 CFR 264.1

FINAL RESPONSIVENESS SUMMARY

KANE AND LOMBARD SITE

BALTIMORE, MARYLAND

From August 30, 1987 through September 28, 1987, the U.S. Environmental Protection Agency (EPA) held a public comment period on the Feasibility Study (FS) for the Kane and Lombard site in Baltimore, Maryland. The purpose of this document is to summarize comments on the FS expressed by residents, local officials, and other interested parties during the public comment period and to provide EPA responses to those comments.

This responsiveness summary is divided into the following sections:

Section I — Site Background. This section provides a brief site history and discusses EPA's preferred alternative for remedial action.

Section II — Summary of Major Comments and EPA Responses. All comments are categorized by relevant topics. EPA responses to these comments also are provided.

I. SITE BACKGROUND

The Kane and Lombard site is an 8.4 acre parcel of undeveloped land located in Baltimore, Maryland. The site is bounded on the north by Lombard Street, on the south by Patterson High School, on the east by recreational fields, and to the west by a trucking company. Located in the Orangeville section of the city, the site is situated less than 1/2 mile from a residential area and the Francis Scott Key Medical Center.

According to site records, the Kane and Lombard site was used to dispose of construction and demolition debris, household trash, and industrial wastes. The site came to the attention of the State of Maryland in 1980 when several hundred drums were discovered on site. Following unsuccessful efforts by the State to force the owner to clean up the site, EPA removed approximately 1200 drums and the surface soil layer from the site. EPA then stabilized the site by regrading, covering the site with a clay cap, and revegetating the site area. In 1984, the Kane and Lombard site was added to EPA's National Priorities List (NPL) and in October 1985, contractors to EPA began a Remedial Investigation/Feasibility Study (RI/FS) of the site.

Remedial investigation activities at the site included examination of the site's history and current conditions with respect to surface characteristics, subsurface soil and geologic characteristics, and surface and subsurface water characteristics. The RI then characterized the chemical contamination remaining at the site by sampling site soils and ground water and assessed the public health threat posed by the site.

Using information collected during the RI, EPA developed an FS that describes and evaluates alternatives for addressing contamination at the site. These alternatives -- known as remedial alternatives -- were evaluated on the basis of how easily they could be implemented, how successfully they could protect public health and the environment, and how much they were likely to cost. As part of the FS, a variety of technologies for controlling sources of contaminants were screened and applied to the alternatives proposed for addressing contamination at the Kane and Lombard site. Because of the presence of other, off-site sources of contamination, the FS was limited in scope to considering the contaminated soil sources at the site. Described in detail in the FS report, these alternatives are summarized in the Proposed Remedial Action Plan (PRAP). The PRAP presents a brief summary of the remedial alternatives developed in the FS report, identifies an alternative preferred by EPA, and provides the basis for the Agency's preference.

After careful consideration of the proposed remedial alternatives, EPA's preferred alternative for addressing contamination at the Kane and Lombard site is Alternative 2: Containment. This alternative would involve:

- Clearing the site;
- Removing drums on the site;
- Constructing a slurry wall below the surface of the site to contain contaminated ground water within the site and divert uncontaminated ground water away from the site;
- Constructing a cap and drainage channels to prevent precipitation from seeping through contaminated materials; and
- Installing facilities to remove the ground water from within the contained area.

While no reduction or other modification of site contamination takes place, this alternative focuses on isolating the wastes, in place, from contact with ground or surface waters, as a means of reducing or eliminating their contribution to water contamination. By implementing site security measures, direct contact with waste materials will be prevented.

II. SUMMARY OF MAJOR COMMENTS AND EPA RESPONSES

EPA held a public comment period on the Kane and Lombard FS report from August 30, 1987 to September 28, 1987. A public meeting was held at the Patterson High School on September 10, 1987 at 7:00 p.m. Those attending the meeting included representatives from EPA, the Maryland Department of Health and Mental Hygiene (MDHMH) Waste Management Administration, area news reporters, and approximately 30 community residents. During the meeting, EPA staff presented an overview of the events that had occurred at the site, described how the Superfund cleanup program works, described the proposed remedial alternatives, and explained why EPA had chosen Alternative 2 as the

preferred alternative. Following this presentation, EPA answered questions from the citizens about the proposed remedies and the cleanup of the site.

EPA participated in a follow-up meeting on September 21, 1987 at 9:00 a.m. in the offices of Congressman Benjamin Cardin (Maryland - District 3) to brief the congressman and his staff on the proposed and preferred remedial alternatives. The meeting was attended by representatives from EPA; staff from the MDHMH Waste Management Administration, Public Information, and Community Relations offices; and citizen representatives from the Eastwood Civic Association and the BEDCO association.

Questions, comments, and concerns received during both meetings and throughout the comment period are summarized below and are categorized by relevant topics. Each comment is followed by EPA's response.

ON-SITE CONTAMINATION

Question: Many residents asked what chemicals EPA found at the site.

Response: EPA stated that no contamination was found in either the air or the surface water at the site; however, the soil at the site was contaminated with both organic and inorganic chemicals. The primary contaminant found in surface and subsurface soils was lead. Other contaminants found in the soil included polynuclear aromatics (PNAs), phthaltates, toluene, inorganic compounds, and polychlorinated biphenyls (PCBs). The first ground water zone, which extends to a depth of approximately 10 feet, was shown to be contaminated with cadmium, chromium, nickel, vinyl chloride, dichoroethelene, and trichloroethene.

Question: Several residents asked what chemicals continue to remain on site.

Response: EPA stated that four to five barrels remained on site after the 1984 emergency removal action. These drums were found to contain non-toxic inert chemical residues and do not present a health threat.

Question: Many residents expressed concern that the fence surrounding the site was inadequate and that area children easily could gain access to the site. In addition, several residents cited a recent Baltimore Sun article that referred to breaks in the fence.

Response: EPA responded that no holes had been found in the fence and that representatives of MDHMH checked the fence monthly and also had found no breaks or holes. EPA iterated the importance of parents stressing to area children that the site was illegal to enter without permission and that unauthorized entry could pose a health risk.

Question: Several individuals suggested that many residents believed that the site had been cleaned-up by the 1984 emergency removal action, and were surprised to learn that EPA planned additional action at the site.

Response: EPA stated that the Agency is aware that citizens living near an

emergency site are often left with the impression that once the emergency removal action is complete that the site is cleaned-up. EPA noted that after the 1984 emergency removal actions, the Agency distributed a fact sheet explaining that the emergency actions had eliminated any immediate health threat, and that the site was stabilized. The fact sheet also explained the RI/FS process that EPA must undertake to develop a long-term remedial plan for Superfund sites. EPA also noted that during the interim period between 1984 and the release of the final RI/FS report, EPA contractors regraded the temporary cap and re-seeded the site several times.

Question: One resident asked if contamination at the site could effect the air.

Response: EPA said, that there had been no detection of air emissions or air contamination at the site.

Question: Several individuals asked what the current risk would be to an individual who entered the site.

Response: EPA stated that there would be virtually no health risk to anyone who simply walked across the site, and the only health risk that existed would result from the ingestion of contaminated soil.

Question: Residents also asked how long the contamination will stay in the ground.

Response: The metals that were found in the ground at the Kane and Lombard site will remain in that soil virtually forever. EPA stated that the risk of exposure to the metals that were buried in the soil was extremely slight and that exposure to lead, the metal that poses the greatest health threat, must occur for a long period of time before any adverse health effects would develop. EPA also stated that the proposed clay cap for the site would eliminate any risks of exposure of residents to the contaminants.

Question: A resident asked what the risk of exposure to residents was from the site.

Response: EPA responded that the only health risk from the site was exposure to lead that would occur if individuals were on top of the site and were exposed to contaminated soil for a lengthy period of time, or directly ingested the soil. EPA confirmed that the site posed no health threat to residents living in the area of the Kane and Lombard site.

GROUND-WATER ISSUES

Question: Residents asked if ground-water contamination at the Kane and Lombard site was significant.

Response: EPA stated that the proposed remedial action at the Kane and Lombard site does not specifically address the clean-up of ground-water contamination because ground water in the area is known to be contaminated (potentially from other sites in the area as well as the Kane and Lombard

site). Area ground-water contamination will be the subject of a greater EPA study aimed at treating and cleaning up area ground water. EPA responded that Alternative 2 best addressed additional ground-water contamination by preventing the seepage of surface water through the contaminated soil thus preventing contaminants from entering the ground water and by utilizing a slurry wall to divert the existing contaminated ground water in the first ground-water zone (known as the first barrier zone) to a local waste water treatment plant. This plant is designed to treat water more severely contaminated that the water that would be collected at the Kane and Lombard site.

Question: Residents also asked what chemicals were contaminating the ground water.

Response: EPA responded that the site ground water is contaminated primarily with organics.

Question: Residents expressed concern that the Backwater Treatment Plant, targeted to receive the diverted ground water from the first water barrier zone under the Kane and Lombard site, could not handle the additional waste.

Response: EPA responded that the plant currently is undergoing a major upgrade that will add to the plant's capacity. Agency staff also noted that EPA and the State will monitor the plant and analyze its performance regarding its ability to accept and treat contaminated ground water from the site. The technical feasibility of sending contaminated water collected at the Kane and Lombard site also will be examined in the design phase of the selected remedial alternative. If this review indicates that the preferred remedial alternative is feasible, the plan must be approved by both the State and the City of Baltimore.

Question: Residents asked where the diverted ground water would go until the treatment plant's upgrade is complete.

Response: EPA stated that if the treatment plant is in non-compliance with existing environmental standards, the ground water collected at the Kane and Lombard site would be treated on site.

Question: A resident asked EPA to describe the characteristics of the first barrier zone.

Response: EPA said that the first water barrier zone is approximately ten feet deep and was found to be contaminated with organic compounds.

Question: Several residents asked if the contaminated ground water could effect animals and fish.

Response: EPA stated that the Agency was concerned about the protection of animals and fish from contamination at the site and responded that contaminated ground water from the site could effect animals and fish if the ground water was not diverted and treated. EPA pointed out that the proposed alternative would address this issue.

Question: Several residents expressed concern that the proposed remedy could cause the sewage pipes carrying the diverted ground water to break. Specifically, residents wanted to know how this diversion system would be monitored.

Response: EPA stated that the sewage pipes used to drain the ground water from the site would be tested for leakage. EPA noted that the specifications for the proposed alternative would be examined in the design phase and that a design that did not meet accepted standards would not be implemented.

Question: Residents expressed concern that city residents were still consuming area ground water, noting that an EPA report has implied several area drinking water wells were still active.

Response: EPA noted that the draft FS had indicated that there were several ground-water wells in the area; however, subsequent investigations found that none of these wells are still in use, thus city residents are not using water from these wells and no threat exists from contaminated ground water.

OFF-SITE CONTAMINATION

Question: A resident asked if other areas surrounding the Kane and Lombard site would be investigated by EPA.

Response: EPA stated that other properties in the area of the site (notably the Picorp property across Lombard Street) would be investigated by EPA for possible remedial action. EPA stated that each of the properties that were suspected of being contaminated were considered separate from the Kane and Lombard site and would need to be investigated and ranked on the National Priorities List (NPL) before cleanup could begin. EPA also stated that the Agency would pursue an expedited ranking of the Picorp property on the NPL, however, EPA could not predict a specific date for this action.

Question: A resident asked why the whole area was not considered one site.

Response: EPA stated that because each site was under separate ownership and because different parties may have dumped materials at each of the sites, separate studies were needed to address potential contamination at each site.

Question: Several residents inquired if the area playing fields had been tested.

Response: EPA stated that the playing fields surrounding the site had been tested and that no hazardous contaminants had been found. EPA further stated that there was no risk of future contamination because the lead in the soil at the site was "locked" into that soil and would not migrate away from the site.

Question: One resident asked what were acceptable background levels for the contaminants discovered.

Response: EPA stated that for lead, the primary contaminant discovered in the

soil at the site, background levels along the East Coast are typically 1 - 200 parts per million (ppm), city levels are typically 500 -1500 ppm, and the levels detected at the site are 1000 - 1500 ppm. EPA said that long-term exposure to levels of 1000 ppm or greater can result in elevated levels of lead in blood.

Question: A resident asked if there were any additional risks associated with the site.

Response: EPA stated that there were none.

Question: Residents noted that a recent Baltimore Sun article implied that residents living in the Village of Orangeville were effected by contamination.

Response: EPA stated that there is no evidence that the Village of Orangeville is effected by contamination from Kane and Lombard site. In addition, EPA stated that the Agency does not know where the newspaper received that information, but speculated that since the Kane and Lombard site is located within the Orangeville section of Baltimore, the newspaper had inferred that the Village of Orangeville was effected by contamination.

Question: A resident asked if there were any reports of long-term health impacts from past exposure to the site.

Response: EPA stated that they were not aware of any reported health problems that could be related to the site.

SELECTION OF ALTERNATIVE

Question: Many residents asked EPA to further explain why Alternative 2 had been chosen.

Response: EPA stated that Alternative 2 was selected because it: could be implemented in a timely manner; utilized a proven technology; protected health by effectively providing source control of the contaminants in the soil by isolating the wastes, in place, from contact with ground or surface waters; addressed ground-water contamination; and could be constructed for a reasonable cost.

Question: A resident, citing that the site had been capped with clay after the 1984 emergency removal actions and that this cap had required patching, asked if the new cap would last long enough to protect residents from site contamination in the future.

Response: EPA stated that the clay cap placed on the site after the emergency removal actions was temporary and that the cap planned for the long-term remedial response would be of a different design which has been used extensively and been proven to be effective. EPA also stated that the cap would be monitored for a period of 30 years and that the cap could be repaired if necessary.

Question: Several residents wanted to know why the contaminated soil at the

site could not be excavated.

Response. EPA stated that the Superfund Amendments and Reauthorization Act of 1986 (SARA) was written to emphasize permanent on-site treatment rather than excavation and removal. EPA also cited the Resource Conservation and Recovery Act (RCRA) that bans land disposal of hazardous wastes after November 1988. An additional concern regarding excavation of the Kane and Lombard site is the length of time that this operation would require (EPA estimated that excavation would require the removal of 8 cubic acres of soil), and the potential for spreading contamination through soil and dust that this action could cause. Finally, EPA stated that with excavation, it is virtually impossible to ensure that 100% of all contamination would be removed, thus the site could potentially still require additional remediation after excavation.

Question: Several residents inquired if the type of cap proposed for the Kane and Lombard site was in use at any other sites in the area.

Response: EPA answered that this type of cap is used at the Sully Road Landfill.

Question: An individual asked if the proposed cap would cause surface water runoff problems at the site.

Response: EPA said that no runoff/erosion problems currently exist at the site and that Agency staff do not foresee the cap creating new runoff problems. As part of the preferred remedial action, the site would be regraded to minimize any future problem with both runoff and erosion of the top soil and/or clay cap.

LONG-TERM MAINTENANCE

Question: Several residents were concerned that the clay cap would not last long enough to protect future area residents.

Response: EPA stated that the cap would be monitored annually and that if any problems arose, the cap could be patched and repaired. EPA also stated that the Agency would retain responsibility for the effectiveness of the selected remedial alternative and would repair the cap if an emergency occurred or if a threat to human health and the environment developed. EPA, however, would transfer the responsibility for the normal operation and maintenance of the selected remedy to the State after the first year of this phase.

Question: Residents wanted to know who would monitor the site.

Response: Under a contract between EPA and the State, the State of Maryland Department of Health and Mental Hygiene Waste Management Administration would monitor the site.

Question: Many residents were concerned that site contamination would still exist after the 30 year design life of the preferred remedial alternative.

Response: EPA stated that it would be impossible to accurately predict past

the 30 year design life of the remedial response. EPA also stated that the Superfund law, which regulates hazardous waste sites, is designed to oversee the treatment and proper disposal of wastes at hazardous waste sites for the life of the threat from contamination.

Question: One individual asked who would be responsible for the health and safety of area residents if an unanticipated problem arose with the preferred alternative some time in the future.

Response: EPA responded that even though the site will be monitored by the State, EPA would be responsible for correcting any flaw in the remedial alternative and would maintain the authority to act immediately if such a situation evolved.

Question: An individual asked if any special security measure would be taken at the site to prevent future dumping.

Response: EPA stated that no specific security measures would be established at the Kane and Lombard site other than maintaining the existing fence. As part of the operation and maintenance phase, however, the site will receive regular inspections. EPA further noted that citizens can help protect the site by reporting unusual or increased activity at the site during this phase of the cleanup.

DISPOSITION OF LAND

Question: A resident asked who owned the site property and why the owner(s) was not being to required to pay for cleanup costs.

Response: EPA responded that the owners name could not be released, but EPA was involved in enforcement action to recover the costs of the cleanup from the owner. EPA stated that the cleanup had commenced prior to the recovery of those costs so that EPA could stabilize the site, and protect human health and the environment in a timely manner.

Question: One resident asked what would be done with the land after the construction of remedial alternative was complete. Specifically, the resident asked what the land could be used for in the future.

Response: EPA stated that it does not have title to the land, therefore the Agency could not provide a specific answer. EPA pointed out, however, that any future use of the land would need to receive a land use permit from EPA or the State, and that any proposed future uses would be examined carefully to ensure that the use posed no threat to human health and the environment. EPA further noted that because of the nature of the contamination at the Kane and Lombard site, and the effect of a permanent cap, the site could be used as a storage area for businesses in the vicinity of the site if the clay cap was covered by an asphalt cap.

SCHEDULE OF CLEANUP

Question: Residents asked when EPA expected the cleanup to begin.

Response: EPA responded that the Record of Decision (ROD) was expected to be signed by the end of September 1987, and 120 days later, EPA and the State expected to begin the design of the selected remedial alternative for the Kane and Lombard site. Construction of this design could begin within one year of this step, and the preferred remedial alternative (Alternative 2) would take about one year to complete.

KANE AND LOMBARD STREETS DRUMS
SARA ADMINISTRATIVE RECORD *
INDEX OF DOCUMENTS

Site Identification

1) Memorandum to Mr. Ed Shoener from Mr. Harry Compton regarding soil vapor survey, dated 10/15/86. Soil vapor results and map are attached to memorandum.

2) Report: Potential Hazardous Waste Site Inspection, dated 5/16/84.

3) Chronology of events at Kane and Lombard site, dated 5/1/84.

4) Potential Hazardous Waste Site Identification, dated 4/30/84.

5) Complaint and Order filed by Mr. and Mrs. Azrael and Ms. Cele Landay with the Maryland Department of Health and Mental Hygiene, dated 10/23/83.

Remedial Response Planning

1) Letter to Mr. Ronald Nelson from Mr. Thomas Voltaggio regarding chronology of events since the Remedial Investigation/Feasibility Study, dated 7/16/87.

2) Report: Remedial Investigation Report for the Kane and Lombard Street Site Volume I - Technical Report, dated 5/87.

3) Report: Remedial Investigation Report for the Kane and Lombard Street Site Volume II - Appendices, dated 5/87.

4) Memorandum to Ms. Stephany Del Re' from Mr. Gary Sheehan regarding July 1986 test pit program at Kane and Lombard Street Site, dated 9/15/86.

5) Permit: Right of Entry by Haven Corporation and Sky properties, dated 7/31/86.

6) Record of Communication: Meeting with Mr. Richard Mason, dated 7/30/86.

7) Letter to Mr. Richard Mason from Ms. Stephany Del Re' regarding permission to take samples, dated 7/30/86.

8) Letter to Mr. Kinloch N. Yellot III from Ms. Stephany Del Re' regarding permission to take samples, dated 7/23/86.

9) Memorandum to Ms. Stephany Del Re' from Ms. Tracy Lacosta and Mr. Charles Kufs regarding results of Phase RI - I sampling, dated 7/21/86. Sample results are attached to memorandum.

* Administrative Record available 7/31/87.

10) Statement of Work/Specifications regarding soil sampling, dated 7/14/86.

11) Report: Initial Site Evaluation and Work Plan for Kane and Lombard Remedial Investigation/Feasibility Study Volume I, dated 5/29/86.

12) Report: Project Operations Plan for Kane and Lombard Remedial Investigation/ Feasibility Study, dated 5/21/86.

13) Report: Historical Development of Kane and Lombard Site, dated 5/19/86.

14) Letter to Mr. Thomas Voltaggio from Mr. John Koontz regarding comments on remedial work plan, dated 5/14/86.

15) Letter to Mr. John Koontz from Mr. Thomas Voltaggio regarding draft work plan, dated 4/10/86.

16) Memorandum to Ms. Stephany Del Re' from Mr. Charles Kufs regarding Addendum number one to the revised Remedial Investigation/Feasibility Study work plan, dated 4/1/86.

17) Memorandum to Ms. Stephany Del Re' from Mr. Charles Kufs regarding state comments on Kane and Lombard site work plan, dated 3/11/86.

18) Letter to Mr. Thomas Voltaggio from Mr. John Koontz regarding file review for the work plan, dated 3/10/86.

9) Memorandum to Ms. Stephany Del Re' from Mr. Charles Kufs regarding results of the site contamination survey, dated 1/16/86. Maps and soil sample summaries are attached to memorandum.

20) Briefing for Ms. Stephany Del Re' from Mr. D. Hill regarding results of geophysical survey at Kane and Lombard site, dated 12/30/85.

21) Memorandum to Ms. Stephany Del Re' from Mr. Charles Kufs regarding results of the geophysical survey of the Kane and Lombard site, dated 12/11/85. Maps and charts are attached to memorandum.

22) Memorandum to Ms. Stephany Del Re' from Mr. Charles Kufs regarding results of site erosion assessment, dated 11/25/85. Maps and photographs are attached to memorandum.

23) Report: Work Plan for Kane and Lombard Site Remedial Investigation/ Feasibility Study Volume I, dated 6/5/85.

24) Memorandum to Ms. Stephany Del Re' from Mr. R. Le Steiner regarding schedule of deliverables, dated 4/29/85.

25) Action memorandum to Mr. Stanley Laskowski from Mr. Stephen Wassersug regarding authorization to proceed with a Remedial Investigation/Feasibility Study at Kane and Lombard site, dated 3/21/85.

) Letter to Ms. Stephany Del Re' from Mr. Guy Hager regarding review and recommendation of Investigation and Feasibility Study, dated 3/21/85.

27) Report: Public Health Evaluation (undated).

Emergency Removal Response

1) Daily log notes, dated 6/6/87 to 3/30/87.

2) Letter to Mr. Bob Caron from Mr. Warren Black regarding ERCS delivery order at Kane and Lombard site, dated 3/26/87.

3) Memorandum to Dr. J. Winston Porter from Mr. James M. Seif regarding request for exemption from six month limitation and continuation of removal activities at Kane and Lombard site, dated 1/22/87.

4) CERCLA immediate removal pollution reports, dated 6/5/85 to 3/6/84.

5) Letter to Mr. Richard Warren from Mr. Thomas P. Eichler regarding immediate removal action at the site, dated 6/15/84.

6) Report: Project Summary Kane and Lombard Streets Hazardous Waste Site Cleanup, dated 6/14/84.

7) Report: Final Report of Analytical Services for Project 1828 - E16 Kane and Lombard Street Site, dated 6/13/84.

8) Letter to Mr. Thomas P. Eichler from Mr. Warren K. Rich regarding sampling visit, dated 5/15/84. Chronology of events, letter, envelope, and notice letter are attached to letter.

9) Air and Contractor Monitor Log, dated 5/12/84 to 6/4/84.

10) Report: Federal On-Scene Coordinator's Report Kane and Lombard Streets Drum Site, dated 5/7/84 to 6/8/84.

11) TAT Site Log, dated 5/6/84.

12) AST Log, dated 5/6/84.

13) Memorandum to Mr. Lee Thomas from Mr. Thomas Eichler regarding justification for approval of an immediate removal action, dated 5/4/84. Funding request, maps, complaint order and photographs are attached.

14) Record of communication to Mr. Bob Caron from Mr. Truitt regarding drum sampling, dated 4/20/84.

15) Report: CERCLA Immediate Removal Project Kane and Lombard Streets Dumpsite Sampling Reference Notebooks (undated).

16) Meeting attendance list (undated).

Community Involvement

1) Record of Communication from Ms. Jill Bloom regarding information on Kane and Lombard, dated 8/13/86.

2) Excerpt from the Hazardous Waste Site Report regarding the planned Remedial Investigation at Kane and Lombard site, dated 6/23/86.

3) Press release from U.S. EPA regarding commencement of Remedial Investigation/ Feasibility Study, dated 6/9/86.

4) Fact sheet regarding EPA role at Kane and Lombard site, dated Spring 1986.

5) Kane and Lombard on-site discussions regarding meeting with community members, dated 5/8-9/86.

6) Memorandum to Ms. Rachel Pohl from Mr. Ronald Nelson regarding Kane and Lombard draft community relations plan, dated 12/4/85.

7) Fact sheet regarding work completed at site, dated 7/85.

8) Fact sheet regarding health and environmental information, dated 6/26/84.

9) Close-out memo for Kane and Lombard public meeting, dated 6/26/84.

10) Public Notice regarding community meeting concerning the hazardous waste cleanup at the Kane and Lombard site, dated 6/26/84.

11) Agenda for the Kane and Lombard site public meeting, dated 6/26/84.

12) Press release from U.S. EPA regarding completion of cleanup at the Kane and Lombard site, dated 6/26/84.

13) Fact sheet regarding the Kane and Lombard site hazardous waste cleanup, dated 6/25/84.

14) Congressional Inquiry/Request regarding the Kane and Lombard public meeting, dated 6/22/84.

15) Press release from U.S. EPA regarding public meeting at Kane and Lombard site, dated 6/20/84.

16) Press release from State of Maryland Department of Health and Mental Hygiene, regarding completion of Kane and Lombard cleanup, dated 6/5/84.

17) Press release from State of Maryland Department of Health and Mental Hygiene, regarding prospective removal of wastes at Kane and Lombard Streets, dated 6/1/84.

18) Fact sheet regarding health effects allegedly caused by the removal of hazardous waste and the previous accumulation of waste at the site, dated 5/31/84.

19) Memorandum to Ms. Helen Przybylski from Ms. Linda Smeyne regarding weekly update on Kane and Lombard Streets cleanup, dated 5/28/84.

20) Letter to Mr. Robert Stansbury from Mr. John Koontz regarding sampling of playgrounds, dated 5/22/84.

21) Memorandum to Ms. Helen Przybylski from Ms. Linda Smeyne regarding weekly update on Kane and Lombard Streets cleanup, dated 5/15/84.

22) Congressional Inquiry/Request by WBAL-TV regarding past visits by EPA to the Kane and Lombard Site, dated 5/9/84.

23) Congressional Inquiry/Request by WSER regarding Kane and Lombard site, dated 5/7/84.

24) Memorandum regarding Agenda for Kane and Lombard site Public Meeting, dated 5/7/84. Press release from Congresswoman Barbara Mikulski is attached to memorandum.

25) Public notice regarding public meeting, dated 5/7/84.

26) Press release from U.S. EPA on immediate removal of volatile substances at Kane and Lombard Streets Site in Baltimore, dated 5/7/84.

27) Congressional Inquiry/Request regarding information in press release, dated 5/7/84.

28) Fact sheet regarding immediate removal of hazardous wastes at Kane and Lombard Streets, dated 5/7/84.

29) Press release from U.S. EPA regarding immediate removal of drums at Kane and Lombard Streets Site in Baltimore, dated 5/7/84.

30) Immediate Removal Community Relations Plan, dated 5/1/84.

31) Fact sheet regarding removal progress, dated 5/84.

32) Congressional Inquiry/Request from WBAL regarding meeting at Kane and Lombard Street site (undated).

Data Summary Sheets *

1) Summary of concentrations of inorganic compounds and subsurface soils, dated 9/12/86. Summary includes information on samples SD-01 through SD-18, SS-01 through SS-05, TP-A through TP-O, and TP-P through TP-Y.

2) Memorandum to Mr. Charlie Kufs from Ms. Dianne Therry, regarding sample numbers CE 801 through CE 818, and CE 819 through CE 829, dated 7/18/86.

* Data supporting the summary sheets is located at the EPA Region III Central Regional Laboratory in Annapolis, Maryland.

3) Memorandum to Mr. Stephen Wassersug from Mr. Carroll Wills regarding results of RCRA characteristic tests for wastes from the Kane and Lombard Streets Site, dated 6/26/84.

4) Memorandum to Dr. T. O. Meiggs from Dr. J. H. Lowry regarding RCRA ignitability and EP toxicity characterization analysis results for drum samples collected from Kane and Lombard, dated 6/25/84.

5) Memorandum to Mr. Bob Caron from Mr. Daniel Donnelly regarding sampling, dated 6/6/84.

6) Memorandum to Mr. Daniel Donnelly from Mr. John Austin regarding samples 840517-01, 840517-03, 840517-04, and 840521-01, dated 6/5/84. Raw data sheets and chain of custody reports are attached to memorandum.

7) Memorandum to Mr. Daniel Donnelly from Mr. B. A. Sammons regarding samples 840517-01, 840517-03, 840517-04, 840521-01, and 840522-01, dated 5/25/84. Pesticide/PCBs priority pollutant compound detection limits are attached to memorandum.

8) Memorandum to Mr. Daniel Donnelly from Mr. Rick Dreisch regarding samples 840517-01 through 840517-04, dated 5/21/84.

GENERAL GUIDANCE DOCUMENTS *

1) "Promulgation of Sites from Updates 1-4," Federal Register, dated 6/10/86.

2) "Proposal of update 4," Federal Register, dated 9/18/85.

3) Memorandum to U. S. EPA from Mr. Gene Lucero regarding community relations at Superfund Enforcement sites, dated 8/26/85.

4) Groundwater Contamination and Protection, updated by Mr. Donald V. Feliciano on 8/26/85.

5) Guidance on Remedial Investigations under CERCLA, dated 6/85.

6) Guidance on Feasibility Studies under CERCLA, dated 6/85.

7) "Proposal of Update 3," Federal Register, dated 4/10/85.

8) Memorandum to U. S. EPA from Mr. Jack McGraw entitled "Community Relations Activities at Superfund Sites - Interim Guidance," dated 3/22/85.

9) "Proposal of Update 2," Federal Register, dated 10/15/84.

10) EPA Groundwater Protection Strategy, dated 9/84.

11) Memorandum to U. S. EPA from Mr. William N. Heckman, Jr. entitled "Transmittal of Superfund Removal Procedures - Revision 2," dated 8/28/84

12) "Proposal of Update 1," Federal Register, dated 9/8/83.

13) Community Relations in Superfund: A Handbook (interim version), dated 9/83.

14) "Proposal of first National Priority List," Federal Register, dated 12/30/82.

15) "Interim Priorities List," Federal Register, dated 10/23/82

16) "Expanded Eligibility List," Federal Register, dated 7/23/82.

17) Uncontrolled Hazardous Waste Site Ranking System: A User's Manual (undated).

18) Field Standard Operating Procedures- Air Surveillance (undated).

19) Field Standard Operating Procedures- Site Safety Plan (undated).

*Located in U. S. EPA Region III office.